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THE MEDICAL TREATMENT OF PEPTIC ULCER AND ITS COMPLICATIONS*

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First of all I wish to thank the British Medical Association for the great honour it has done me by inviting me to open the discussion on the treatment of peptic ulcer and its complications. I feel that the distinction of being singled out from among so many others who have a better right than I has been bestowed upon me in view of the interest shown in the method of treatment I employ in cases of bleeding gastric ulcer—"treatment with food"—and that you desire to hear an account of it at first hand. I will therefore reverse the title of the address and begin by speaking about the treatment of the complication, haemorrhage, and then pass on to relate how my experiences of this have influenced my view of the general treatment of peptic ulcer.

Until 1931 I used, in common with all my fellow countrymen, and indeed everybody else, the current treatment for bleeding gastric ulcer—namely, absolute immobility, ice box, ice pills, inanition, milk in quite small and carefully increasing doses, and slow transition to a modified Lenhartz diet. The principle was, "The more severe the haemorrhage was, or had been, the more stringent the inanition and the other measures taken." After some practical experiences I had had, and encouraged by certain lines of reasoning, into which there is hardly time to enter now but of which the main point was that it must be fundamentally wrong to withhold food and drink from patients in a condition which can only be described as post-haemorrhagic shock, I altered my treatment from 1931 in such a manner that in cases of fresh bleeding ulcer—that is, in haematemesis and melaena—the patients were given *something to eat, from the very first day—a varied and liberal diet, and ad libitum.* I have adopted this method of treatment automatically from 1931 until now.

I should mention that Lenhartz already had the same principle in mind, and Sir Edmund I. Spriggs, who introduced the Lenhartz treatment into Great Britain, gave to his communication published in 1909 the following title: "Remarks on the Treatment of Gastric Ulcer by Immediate Feeding." This freer principle seems, however, to have passed into oblivion, and I believe I can say that about the year 1931 the tendency in most places was exactly in the opposite direction.

* Read in opening a discussion in the Section of Medicine at the Annual Meeting of the British Medical Association, Aberdeen, 1939.

My Regime

The treatment is as follows (Meulengracht, 1935): From the day of admission to the hospital all the patients are given a full purée diet, alkali, belladonna, and big doses of iron. The purée diet includes the following meals: 6 a.m.—tea, white bread and butter. 9 a.m.—oatmeal with milk, white bread and butter. 1 p.m.—dinner, including a variety of dishes. 3 p.m.—cocoa. 6 p.m.—white bread and butter, slices of meat, cheese, and tea. The patients are encouraged to eat *ad libitum*; water and milk are put on the table, and they should drink as much as they like.

With regard to the purée diet, I should like to say that at the time I instituted this treatment I chose the diet which we were using for slight indigestion, but I might just as well have chosen any other form of soft non-irritating food, because *it is not a question of a special diet but rather the adoption of a principle—namely, something to eat and drink, fluid and food; that is to say, water, salts, vitamins, calories.* We have also simplified the other part of the treatment. We have abandoned the customary immobility. From the very first day the patients are allowed to move freely in bed, and after about a fortnight they are permitted to get up to wash, shave, go to the w.c., etc. After about three weeks they are out of bed, and in four to five weeks they are discharged from hospital. Before they leave a test meal is given and an *x*-ray examination made, and they are ordered to continue taking the medicine for another four to six weeks and the purée diet for four to six months.

The Material

The experience I have gained with the free regime in the eight years since 1931 is based on an extensive material amounting, up till January 1, 1939, to a total of 491 cases of profusely bleeding ulcers. Haemorrhage from cancer of the digestive canal and from dilated vessels in cirrhosis of the liver has been excluded from the material, so far as it was possible, by clinical means and post-mortem examination. The material should therefore embrace only haemorrhage arising from acute and chronic peptic ulcers. With respect to the nature of the material I may say that the cases consist of gross

haematemesis and gross macroscopic melaena. Occult melaena, which is demonstrable only by chemical examination of the faeces, is not included.

The Results

What results have we obtained with this treatment? First, the purely immediate reaction, that *the patients feel well on it and like it.* There may be a few patients who, on account of nausea, find it difficult to eat and drink during the first twenty-four hours, but it has been found that the best remedy for the nausea, which is caused by an accumulation of blood in the stomach, is to introduce food and drink into the latter. The majority of the patients took their food with a good appetite and without misgivings, even those who had experienced the inanition treatment on previous occasions and who, mindful of the earlier directions, were perhaps at first afraid of eating and drinking *ad libitum.*

But it is of greater importance that by this treatment the patients escape the disagreeable and dangerous period of exhaustion which in old days was provoked or maintained by thirst, hunger, immobility, and all the tantalizing annoyances which made it difficult or impossible for them to regain their strength after the haemorrhage. The patients now make a rapid recovery from the post-haemorrhagic shock and soon regain their strength; they have, indeed, hardly had time to lose it. And so it goes on: it is almost impossible to keep the patients in bed. They feel so well that they soon ask to be allowed to get up, and when after two to three weeks they are out of bed their convalescence is very short, so that they feel completely recovered on discharge from hospital. I recall the old days; they are exemplified by an account of one of my patients. He had had haematemesis some thirty years previously, and had then lain immobile in bed for four weeks on 1 to 1½ litres of "dead-boiled" milk. After a month the physician on his round in the ward said to him: "Tomorrow we will start extra rations." The following day the eagerly waiting patient received his extra ration—it was a cup of oatmeal gruel! No wonder that the patients were exhausted and were avitaminotic convalescents for a long time after this earlier treatment.

Our treatment meant *an enormous simplification* of the work of doctors and nurses; for, as a nurse said to me: "In the old days we were afraid the patient might seize a chance to drink a glass of water, and we reported such an accident to the doctor with fear and trembling. Now we can freely quench his thirst and satisfy his hunger just as in the case of other patients."

With regard to the haemorrhage itself, it can be regarded as established long ago that *food in the stomach does not increase or protract the bleeding*; one may even form the impression that the opposite is the case. I will point out that the actual bleeding as a rule can only last a short time, perhaps only a few hours; the fact that a positive blood reaction (Gregersen's benzidine test) is demonstrable for so long a time—on an average eleven or twelve days, or four or five defaecations—does not mean that the haemorrhage lasts so long, but that it takes that length of time for the intestine to rid itself of blood, so that the faeces give a negative benzidine reaction. It is very important to have a clear conception of this fact, because a wrong interpretation has so largely contributed towards prolonging the fear of giving the patients something to eat. It used to be believed that they were still bleeding so long as blood was chemically demonstrable in faeces.

It is satisfactory, but not of vital importance, that *the lost blood is more quickly regenerated with the freer regime*, for as a rule the normal values for haemoglobin and the number of red blood corpuscles are approximately reached within four or five weeks. This is only what one would expect in the light of Whipple's experiments on the best regeneration conditions in experimental anaemia from loss of blood in dogs. The question of the regeneration of the blood in our patients has, moreover, been subjected to a closer study by my collaborator Schiödt, who has constructed the typical regeneration curves for the earlier insufficient diet (inanition and increasing ulcer cure) and for the present freer regime with a more sufficient diet.

Effect on Mortality Rate

But the decisive test of the merit of the treatment is the mortality. I will, without further preamble, give the figures. Of the 491 patients ten died. One of these died six days after admission from perforation with diffuse peritonitis. Four arrived in a highly anaemic condition and died shortly after admission without having begun any treatment, especially no "treatment with food." The others died from recurrent arterial haemorrhage two, six, seven, eight, and seventeen days respectively after admission. A post-mortem examination revealed chronic ulcers with erosion of arteries in all the nine cases. It can well be claimed that the *mortality rate has been between 1 and 2 per cent.* A lower one can hardly be expected: there must always be a certain basic death rate.

In comparing this mortality with those associated with other forms of treatment one is confronted with the difficulty that the material corresponding to the different forms clearly varies in character. The mortality given in the different publications from Great Britain varies extraordinarily, and it is evident that the material of the various investigations must be heterogeneous and that the high death rate in some of the sets of statistics is due to the fact that only the most severe cases are taken into hospital. I understand that this is to a certain extent the case in London. I would point out with regard to my own material that on account of the particular hospital conditions in Copenhagen, with the great facilities for admission, practically every case of haematemesis or of diagnosed melaena is taken into hospital, so that it is possible that on the whole my cases are of a somewhat milder character than the hospital cases in England. Direct comparison with English material is therefore difficult, but when the comparison is made with other Danish and Scandinavian material, which should be on a par with my own, and where the old treatment was used, it appears that the mortality is given as from 7 per cent. to 10 per cent., which corresponds with my earlier figures. It must be stated, however, that, irrespective of which treatment is employed, the mortality rate seems to have had rather a downward tendency during the last decades. This is apparently connected with the curious shift in the distribution of ulcer that has taken place during the same period. This latter fact has been closely investigated by my collaborator Alsted, who has published a book in English on the subject. It appears that, at any rate with us in Denmark, ulcer has become rarer in women and commoner in men, while at the same time it has moved down towards the duodenum. Haemorrhage has simultaneously become more frequent, but possibly less severe. This may to some extent influence my figures.

All things considered, I venture to assert that the introduction of the freer regime has meant a decided decrease in the mortality—a decrease so definite that I do not consider it justifiable to continue with the old principles of treatment. But to those who might wish to go over to the new regime with free feeding I should like to say that if they begin the treatment they must go the whole length and not proceed with hesitation and caution, especially in the severe cases. The motto logically must be: "*The more severe the haemorrhage is or has been, and the more the patient is exhausted, the more he needs the support of fluid and food.*"

With regard to the effect of the freer regime on the healing of ulcer (ulcer disease), I shall return to this subject later, but I will make a brief remark here about the operative treatment of the bleeding ulcer with a view to haemostasis. My attitude towards this question is theoretical, because I have never referred any patient with bleeding ulcer for operation. I consider that a mortality of from 1 to 2 per cent. makes this question unreal for me and relieves me of the responsibility of having to decide in an individual case whether operation is advisable or not. Of the nine patients who died from haemorrhage, three were over 70 years old, one had chronic nephritis and cardiac insufficiency, while the rest were cases of profuse arterial bleeding with death rapidly supervening. How could one possibly sort out these few cases before it was too late? No; I leave it to Providence with a calm conscience, and only when the condition is threatening do I resort to blood transfusion.

The views regarding the treatment of bleeding ulcer which I have sponsored have begun gradually to win approval in various countries, including, I understand, England, and I am particularly glad that Professor Witts (1937) and Dr. Lazarus have added their support.

Treatment of the Non-bleeding Gastric Ulcer

The experience I have gained from the treatment of haematemesis and melaena could not fail to influence my outlook on the medical treatment of the ordinary non-bleeding gastric ulcer. The immediate therapeutic indication, it is true, is different here, because the patients seek medical aid for the *pain*—cardialgia—whether it is a case of acute or of chronic ulcer; and the immediate indication for treatment is therefore the pain, while the indirect indication is again the healing of the ulcer. The old Leube treatment was to some extent a hunger cure, which, according to our present knowledge of nutritional needs, was both quantitatively and qualitatively absolutely insufficient. The Lenhartz treatment, with its abundant allowance of eggs and milk, was quantitatively and qualitatively a more adequate diet, although not absolutely so; but it had other drawbacks, and in its strict form is now hardly employed at all. It has been modified and changed, and one may perhaps say that the ordinary treatment of ulcer at the present time is largely in the melting-pot in many parts of the world. Some use a restricted hunger cure in the hope of "protecting the stomach," as it is called; but in various places entirely opposite principles are coming to the fore—that is to say, the ulcer treatment is planned in the form of a freer, varied, and more abundant diet, which is, so far as possible, quantitatively and qualitatively sufficient.

When in 1931 I reversed my treatment of bleeding ulcer and gave the patients abundant and varied food, I did it as an experiment, but I continued at that time the current treatment for the ordinary non-bleeding ulcer, which was a greatly modified Lenhartz cure. But gradually I also made the diet more liberal and varied in non-bleeding ulcer, and my treatment of painful ulcer now approximates to that of bleeding ulcer. I maintain that the results are improved by it: the pain disappears just as well, and relapses do not seem to be more frequent. The treatment is supplemented with alkalis and belladonna.

In the course of time it has dawned on me, as on so many others, that factors other than food play a determining part in ulcer disease. It is not the "good eaters" who develop ulcer, but rather the "starvers"; it is men—lean men, busy men, overactive men—who do not give themselves proper time to eat, and when busy prefer to smoke a cigarette rather than take a snack between meals.

But not until I came across an excellent paper by two of your countrymen, Davies and Macbeth Wilson (1937), did the scales fall from my eyes, and the significance of these factors become clear to me in all their bearing. Hurst, Ryle, and others had previously given expression to similar ideas, but it is Davies and Macbeth Wilson's work—you all undoubtedly know it: "Observations in the Life History of Chronic Peptic Ulcer"—which so forcibly and convincingly describes the part played by the nervous element in the development and persistence of gastric ulcer, both the nervous constitution of the patient and the external events in life which may influence it: "the soil and the seed." I entirely agree with the authors mentioned, that the patient with gastric ulcer is a characteristic type of man, of whom Davies and Macbeth Wilson give such an excellent psychological description, even including a characteristic "ulcer face." A well-known portrait artist, who himself had an ulcer, volunteered the remark to me: "I can see in a man's face, when I pass him, whether he has a gastric ulcer."

I will not discuss here in what way a definitely nervous constitution, accentuated by the external events of life, can be imagined to assume such a localized expression as acid gastritis with ulcer, but it is my conviction that it must be reckoned with as a factor when planning the medical treatment of gastric ulcer. I hold the view, confirmed by my experience of the last few years, that the fundamental principles of the medical treatment of ulcer must be: rest, relaxation, food—a soft non-irritating food but plenty of it—*adequate quantitatively and qualitatively and taken at frequent meals. The ulcer diet "must not lack anything"—that is to say, it must be sufficient not only quantitatively but also qualitatively and must contain the necessary amount of vitamins and salts.* In comparison with these factors—rest, relaxation, frequent feeding—it is of less interest to me whether alkali in some form or other, perhaps supplemented by belladonna, is given as medicine. I use both these drugs, and believe that they are of value, but to me they are not a matter of prime importance.

Those who have not become used to these basic ideas will mostly feel constrained to continue to restrict the diet and to deny their patients food—nay, even to look upon food as something harmful; and they will find it difficult to believe that the cardialgia disappears just as easily or even better with rest, relaxation, and food than with strict dietetic instructions. If in the medical treatment of ulcer these basic principles are carried into effect, I believe that every country will gain by varying the details of the treatment according to individual, local, and national circumstances and customs. The details of an ulcer cure ought hardly to be the same in, for example, France and England. When, therefore, I now outline

my own ulcer treatment it merely implies that this is the way in which we manage it in Denmark, at Bispebjerg Hospital, in my department. It consists of rest in bed, though not absolute, for four to five weeks, a soft non-irritating diet with increasing variety during the same period, frequent meals—that is to say, every second or third hour—alkali, and belladonna; tobacco is forbidden. How much importance attaches to the last restriction I shall not go into. We endeavour to make the diet qualitatively sufficient, but I must admit that in certain ways it perhaps leaves something to be desired, and it is conceivable that we ought to pay more attention to remedying possible vitamin deficiencies.

On discharge from the hospital the patients are urged to avoid the most irritating kinds of food for six months, to continue taking frequent meals, to restrict the use of tobacco and not to let "a smoke" take the place of a snack between meals, and also to try to adopt a calmer attitude towards life and its incidents.

Summary

The treatment of bleeding ulcer is first discussed because experience with a free diet has influenced the outlook on ulcer treatment in general.

The results of treating 491 cases of profusely bleeding ulcer are given.

The conclusion drawn is that the more severe the bleeding the more the need for fluid and food. Operative treatment with a view to haemostasis is not advised.

In non-bleeding ulcer it is maintained that use of a freer diet gives improved results; treatment is supplemented with alkalis and belladonna.

The view is held that the basic principles of the general medical treatment of ulcer should be rest, relaxation, and adequate food taken at frequent meals.

References

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Meulengracht, E. (1935). Ibid., **2**, 1220.
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Public Social Services is the title of a handbook produced by the National Council of Social Service with the assistance and approval of various Government Departments, describing in a simple and understandable form the many Acts and Regulations which provide State services affecting the well-being of the general public, their method of administration, and the names and addresses of the respective authorities to whom inquiries and appeals may be addressed. This handbook was first published as a pamphlet in 1917, and it has been revised and enlarged several times since then. The principal differences of administration in Scotland are noted, and information as to how the many social enactments apply to that country has been prepared in co-operation with the various departments of the Scottish Office. Sir Ronald Davison writes on the part played by voluntary organizations and voluntary social workers in the administration of the public services. The chapter on public health deals with infectious diseases, housing, town and country planning, abatement of nuisances, maternity and child welfare, mental deficiency, the welfare of the blind, and the prevention of blindness. The National Health Insurance and Pensions Acts are fully explained. The chapter on the Public Education Services includes sections on elementary and higher education and school medical services, and special reference to neglected and delinquent children. Copies of *Public Social Services* may be obtained through any bookseller or direct from the National Council of Social Service, 26, Bedford Square, W.C.1, price 2s. post free.

FOOD CONSERVATION IN RELATION TO NATIONAL FOOD SUPPLY*

BY

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In this paper I deal with the ways in which food conservation can help the nation in times of emergency. With matters of policy I have no concern. How much of this or that the Government has seen fit to store is not my affair: what I can do is to say something about how science has increased the selection of food at their disposal.

In my own mind foodstuffs for the present purpose fall into three classes: (1) those which can be kept indefinitely—in practice, say ten years; (2) those which can be kept for a season, say ten months; (3) those which can be kept on any ordinary voyage, say two months or less.

Foods that can possibly be Kept Over Ten Years

The first food in this group to occur to anyone would be wheat. Has wheat any valid title to come into this class? The storage of wheat as against emergencies is as old as the book of Genesis. You remember that Joseph had his seven-year plan, which of course was really a fourteen-year plan. This fourteen-year plan is just a little interesting, because not all wheat will keep for fourteen years—in fact, not all wheat will keep for ten years; and, remember, Joseph kept the wheat in Egypt, as we would say under tropical conditions. The higher the temperature at which the food is kept the more difficult it is to store. Speaking generally, most chemical changes are doubled in velocity, or more than doubled, for every 10° rise in temperature. That law, perhaps, does not apply rigidly to a live foodstuff like wheat. Thus, if we, on the one hand, can store without refrigeration at 12° C., and Joseph, on the other hand, had to compete with 42° C., we should be able to keep our stocks eight times as long as Joseph. If he could keep wheat ten years, we should be able to keep the same wheat eighty years; or if he could keep something one year, we should be able without refrigeration to keep it eight years or, by reducing it to two, sixteen years. I mention this not as an idle speculation, but because these considerations are the basis of what we call accelerated tests. If you ask me how I know that a particular sample of food can be kept eight years when it has never actually been kept that length of time, the answer is: I cannot say positively, but if it can be kept one year at 42° C. the chance is sufficiently in favour of our being able to store it for eight years at 12° C. (53° F.) to make that chance worth taking. We are not absolved from the duty of carrying out tests over long periods of time, but meanwhile we have a good deal to go upon by the performance of such accelerated tests as I have described. But to return to Joseph and his wheat. If he was handicapped by the temperature at which he had to store the wheat he had another factor very much in his favour—namely, the dryness of the atmosphere in which the wheat was stored. Not all wheat keeps indefinitely: the critical characteristic appears to be the water content. In the best wheats the water content is low and the wheat will keep. Fortunately some of the best-keeping wheats from this point of view are grown in one of the Dominions. The problem of growing wheat of high keeping property in this country is primarily

* Read in opening a discussion in the Section of Medical Sociology (Nutrition) at the Annual Meeting of the British Medical Association, Aberdeen, 1939.

one for the scientific farmer, and not for the Food Investigation Board; but in the meantime it does not matter very much that the storable wheat comes from over-seas, because the demand for grain so far outruns the home supply that home wheat can be eaten at once.

I wonder whether there were weevils in Egypt. These now constitute a major problem in the storage of wheat over long periods, but they do not, I hope, present one which is insoluble. There is one phase of the subject which is immediately within our purview. Wheat is very bulky. Is there any way in which we can store all that is worth storing in a smaller space and possibly in a more accessible form? This brings me to the storage of flour. I also wonder in what form Joseph's wheat was eaten. It is one thing for wheat to keep, to all appearances, well, but before it deteriorates in appearance it will go back as a material from which to make first-rate flour. Canadian wheat can be kept seven years in this country, and Canadian wheat in Canada has, when sown after ten and a half years, yielded 90 per cent. of grains which have germinated.

Wheat contains about 15 per cent. of water. It is possible to reduce the water content of flour to about 11 per cent., in which case the flour may be stored in tins. In that way it will keep a long time, and, what is very important, is inaccessible not only to water but to weevils. The general conception of adding to the length of storage life by drying has been extended to potatoes. Dried potatoes come into the ten-year category, but of them I treat later. So far I have not touched on the storage of fats in bulk. In this connexion I need only mention that whale oil and vegetable oil, with all their calories, are eminently storable substances. Whale oil can be kept in bulk if air be excluded, perhaps not for ten years, but for something much more than a season, say, three or four years, and if hydrogenated—that is, passed through the first operation in making margarine—the period would be extended.

Quite a different class of material that falls into the category of foods which can be kept for more than ten years is that which embraces canned meat of various sorts. There is no question that if canned meat is properly packed it is entirely suitable for food for a very long time. Of course, such meat has been sterilized by heat, and to that extent its vitamin value has probably been reduced: the comparison is not between canned meat and raw meat, but between canned meat and cooked fresh meat, so that the loss of vitamins does not come into the picture. The subject of flavour raises a point of great interest. We have four senses which matter as regards our judgment of meat—taste, smell, sight, and touch. So far as we know, if the meat will pass all of these its nutritive value is maintained. Perhaps the sense of taste is the most exacting, especially for the fat of meat, or indeed the fats of anything. A very trifling degree of oxidation of fat will alter the flavour of food, be it meat, milk, fish, or even food containing so little fat as biscuits; and in the case of fat the taste will tell the tale before the fat loses either in calorific value or in vitamin value or produces substances irritant to the digestive system.

There are a great number of canned foodstuffs that might be reviewed one by one if space permitted. One in particular is of interest because of its mixed character—a commodity defined in the Concise Oxford Dictionary as "tinned stew or part of the Army rations" (canned meat and vegetable rations). Here I will only mention the very satisfactory result, namely, that whereas the calorific value of the commodity was all that could be desired, it was found to be deficient in vitamin—a very important research—and this deficiency can easily be made good by putting in new potatoes. Much work has been done on this subject of the nutritive value of the protein in preserved foods. On the general subject of the nutritive value of canned foods we are fortunate in having Mr. W. J. Godden here to-day to address us.

The nutritive value of canned foods generally seems to be covered by a sentence or two from a statement issued by the Food Investigation Board (F.I.B. Report, 1937, pp. 3–4), on the authority of the Medical Research Council: "The available evidence therefore suggests that modern methods of storing foods cause little depreciation in their nutritive value—in fact, it may be said that food of good initial quality that has been stored by the best modern methods is likely to be superior in many respects to similar food that, though still technically fresh, is in reality stale." A caveat is then put forward with regard to the destruction of vitamins C and B_1 by heat; but this caveat becomes less urgent, though the vitamins do not become less necessary, if the comparison is between canned food and cooked fresh food.

Seasonal Storage

I must pass to foods which can be stored over a season. The point of course is this: Nature produces spasmodically; man eats at a steady rate. Nature produces in the summer; man eats all the year round—in fact, theoretically he eats most in the winter. Therefore, apart from what we may import from southern climates, one or both of two things must happen: either production must take place on a scale vastly greater than is required so that at its minimum it suffices, or else the excess of summer must be laid up for the winter months. As the former policy is eminently one of waste, it follows that, emergency or no emergency, it should be the aim of science to replace it by the latter: but of course the greater the emergency the greater the urgency. During the last war it was in the months of March, April, and May that the pinch came.

MILK

Of all the foodstuffs which call for consideration in this category the first place must undoubtedly be given to milk, for four reasons: (1) its importance—it contains practically all essential nutritive elements and food factors in an easily digestible form; (2) the principles enunciated above apply so appositely to it; (3) "sciencing" has already gone far to remove the seasonal trouble; (4) the nutritive value of milk has been studied so completely that it may serve for purposes of scientific discussion as a sample of other foods which have as yet been subjected to much less careful scrutiny.

The paramount importance of an ample supply of milk all the year round I need not emphasize. "All the year round" means, or has till recently meant, that the cows of this country must produce daily, even in winter, a quantity of milk ample for the needs of the community: apart altogether from the inferior quality of winter milk, the implication is that in summer there is a superfluity. This milk is made into cheese—perhaps the oldest way of processing milk—and butter, to say nothing of collar-studs, shoe-horns, and the like. Experimental evidence has been adduced that the best milk powders made from summer milk are of greater nutritive value than fresh winter milk. If this be once accepted as a fact its implications are enormous and far-reaching.

But how long can it be kept? Am I justified in placing the best forms of dried milk in the "seasonal" class?

The experiments that have been carried out by quite a number of observers, including the Low Temperature Station, the Dairy Institute at Reading, and Dr. Wright and his staff at the Hannah Institute of Dairy Research, leave no doubt upon this point. In fact, they raise another—namely, would I be justified in putting some dried milks in the ten-year class? The answer, I think, at the present time is that I would not, unless perhaps the milk was held at what I may call refrigeration temperatures. Were I to do so I would have to compromise on the flavour of the milk, though not, I believe, on its nutritive value.

Here I should say that the keeping power of the milk depends upon the way in which it is stored. In fresh milk the onset of *sourness* is the test, but that is not so in the case of dried milk. The fat is the tell-tale, and the chemical change which "turns" the fats is an oxidative one; therefore the secret in keeping sprayed milk powder is in the canning of it in such a way as to exclude air with the required degree of rigidity. Before leaving the question of milk I must not forget that, whatever importance or unimportance winter milk may have, cows and other animals must be kept through the winter. This presents another problem—namely, the seasonal preservation of grass. This matter I merely touch on in passing because it is only remotely of interest to the doctor, but it is one to which the Agricultural Research Council has given a great deal of attention. Apart from making hay—a wasteful process, viewed from the angle of the maintenance of nutritive value—there are two main processes of preserving grass: the making of silage and the desiccation of the grass. The former process has been greatly facilitated and cheapened by the introduction of silos made of paper suitably treated and reinforced; you buy it in rolls, and in a short time can put up a silo anywhere, given the necessary drainage.

POTATOES AND VEGETABLES

Of human foods, considered with regard to seasonal storage, perhaps the next most important to milk is potatoes; but potatoes as a merely seasonal commodity do not offer a problem to such a body as the Food Investigation Board. There is, however, this point: Can potatoes be so preserved as to place them in the ten-year class? Great advances have been made in this direction, and the probable answer is "Yes." The fundamental method is drying till the water content has been reduced to about 8 per cent. Dried potato products, however, present this difficulty—namely, that when an effort is made to reconstitute them into washed potato they come out largely as starch paste. The guiding principle is that in the process of preservation the cells of which the potato is made must be preserved intact, and there are on the market preparations, notably in the form of powder, which are quite satisfactory as regards their keeping quality and the palatability of the meal they afford.

Carrots are particularly important because of their combined calorific and vitamin value. Here again the responsibility lies jointly with the agriculturist and with the food preserver; to the former the problem is that of saving the crop from the devastation of fly; on the latter lies the responsibility for the preservation of the crop. Allusion will be made to green vegetables later.

FRUIT AND EGGS

Among the most obvious and most important of seasonal products is fruit. Dr. Kidd has perhaps done more to put the storage of fruit on a sound basis than anyone else. The improvement in the quality of fruit obtainable the year round and the increase in the variety are among the most astonishing features in our time

Among the important foodstuffs which can be made seasonal in the fresh state are eggs. The housewife was primarily responsible for the elevation of the egg from being a commodity which could be kept for days or weeks to one which could be stored over a season. The water-glass egg should keep at least a year; but at the end of that time, while you cannot call it a bad egg, it surely has severe limitations. True, it is good for cooking purposes, and that is saying a great deal, because the majority of eggs are, after all, used in this way; and it is good for scrambling. However, when it comes to frying, poaching, and above all boiling, something better is required. Moreover, as a large-scale commercial product you have to move the water-glass as well as the eggs. Recent work has produced a great change. The whole question of the effect of storage methods in the various constituents of the egg has been gone into. The three important factors are: (1) the temperature; (2) the moisture; and (3) the carbonic acid content of the air. An index of the improvement is the fact that in the Low Temperature Station at Cambridge they can actually hatch out 25 per cent. of the eggs in a setting after more than a month's storage. The results of a nine-months test may interest you.

Condition of Eggs at End of Nine Months' Storage

Cold Storage between 29° and 32° F.	Cold Storage + 2–2.5% CO_2 + 85% Relative Humidity (29°–32° F.)	Cold Storage + 60–100% CO_2 + 100% Relative Humidity (29°–32° F.)
Shell smooth	Shell slightly rough	Shell slightly rough
Air-cell large	Air-cell large	Air-cell small
White distinctly yellow	White faintly yellow	White faintly yellow
Consistency of white "runny"	Consistency of white satisfactory	White rather "runny"
Yolk flabby	Yolk firm	Yolk firm
Storage taste	No storage taste	No storage taste

The best method, then, is that of cold storage in an atmosphere containing 2 to 2.5 per cent. of CO_2 and with the air highly but not completely saturated with aqueous vapour. Eggs so kept, as well as being satisfactory for cooking purposes, will poach and fry well and, except for those who are so fastidious as to demand a creamy white, are satisfactory for boiling.

Short-term Storage

Lastly, we must consider the storage of foodstuffs over the period of a voyage, and two months will cover a journey from the Antipodes.

The importance of two months' storage is as follows: First, there are many commodities, such as meat and fruit, of which not enough is produced in this country to supply the needs of the nation, whether in peace or war, and to obtain sufficient of these things we must import them from distant quarters of the globe. But in emergency there is this further point: we cannot ignore the possibility of a reduction in our supplies from European countries—even friendly ones. It is important, therefore, to be able to make the most of what we can obtain from sources less accessible to those concerned with the curtailment of our supplies.

FISH AND MEAT

Fish offers one of the most interesting problems. Perhaps there is no food the freshness of which is more

important. Yet much of the fish arriving in our ports has deteriorated a good deal even before it is set on shore. On a winter's day I once watched the catch laid out for auction in a great fishing port. Stormy weather had kept some of the boats for as long as nineteen days at sea. The fish, of course, was ice-packed, but, even at that, much had deteriorated palpably. It was to me a pathetic sight to consider the expenditure of effort, of money, of hardship, perhaps even of life, that lay behind that catch of now indifferent fish. That, however, can be improved upon and all our principal food fishes can be brought into the season class. All important species can be kept in good condition for six months—the fatty fishes perhaps for no more, but the white fishes for longer.

The kipper, again, has normally a life of about a week; but arrangements could be made for herrings landed in Aberdeen to be sold as perfectly good kippers in Australia; and if they can be sold as good kippers in Australia, so they could be here after the same interval.

Another interesting fact which attaches to the preservation of fish is that among foodstuffs at present it stands out as one of which the deterioration can be assayed by chemical methods of the utmost delicacy.

Half of our meat supply comes from over-seas. This fact is so familiar that I need say very little about it, except this: in theory meat can be kept for a very long time. A Siberian physiologist claims to have made the heart of a dog beat thirty-one days after the death of the dog, the body being kept cold. Believe that or not as you please, there is no doubt that American workers have stored meat under sterile conditions—chilled but not frozen—for a year; the flavour had deteriorated, but the chemical changes that had taken place were only very trifling. The storage of meat, therefore, whether mutton or beef, is really a problem in cleanliness. Two factors should be realized: (1) that the meat should throughout its history come in contact with the fewest organisms; (2) that it should be kept under conditions as unfavourable as possible to the growth of such organisms as come its way. Both conditions are very much the business of the Food Investigation Board and of its associates in the Dominions: the second has been met by the gas storage of chilled meat.

Preservation over Shorter Periods

The subject of preservation over shorter times and shorter journeys, the insurance that lettuces or strawberries should reach the customer as fresh as when they were picked, is one of which I will only treat very lightly. First let me say that I have been taken to task for putting strawberries and lettuces in the same category. From the point of view of transport they are similar, but in importance they differ greatly: strawberries are a luxury; lettuces are the very type of green vegetable so important for its vitamin value. The storage of hundreds of tons of lettuces merely to provide a given number of grammes of vitamin seems the wrong policy. Surely the ultimate aim must be the manufacture and storage of the vitamins or vitamin concentrates. Meanwhile the provision of green vegetables out of season seems to leave a good deal to be desired in times of emergency.

The word "emergency" brings me to one final sentence. Although the statement I have just made is definitely a review of the position in the light of a possible emergency, the review has much wider implications. The possible implications have been put forward with all the authority of Maynard Keynes at the Cambridge meeting of the British Association; it would be an impertinence for me to do more than allude to them. They are, however, in brief, that much work could be saved, prices could be stabilized, and speculation discouraged by a policy of storing foodstuffs which could be released in the correct quantities at the appropriate moments.

Summary

This paper deals with the contribution which food investigation has made to the facilities for the supply of commodities to this country, especially in time of emergency.

Foodstuffs are discussed under three main headings, according to the length of time they can be kept.

It is considered that the ultimate goal would be the manufacture and storage of the vitamins.

THE COMMONER TYPES OF SUPERSENSITIVENESS AND THEIR MANAGEMENT

BY

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Supersensitiveness has been defined as the liability of an individual to suffer severe effects of a special nature on exposure to certain agents which are harmless to others, at least in the doses used (Browning, 1934). The terms "allergy," "idiosyncrasy," and "hypersensitiveness" have been employed as equivalent terms. This condition may show itself in connexion with many of the body tissues—for example, the respiratory tract, the gastro-intestinal tract, and the cutaneous structures, depending on the susceptibility of the individual. Thus one patient may display catarrhal manifestations of supersensitiveness affecting the mucous membranes of the nasopharyngeal region (hay fever), while in another, bronchial spasm occurs with resultant asthma. In others, varieties of cutaneous manifestations may be seen—for example, angioneurotic oedema, urticaria, dermatitis, etc.; also nausea and colic may be due to gastro-intestinal supersensitiveness.

Manifestations of Supersensitiveness

Asthma.—Owing to its wide and somewhat indiscriminate use "asthma" should be defined. Asthma, as distinct from the dyspnoea of simple bronchospasm, is a type of paroxysmal dyspnoea occurring in individuals in whom certain primary essentials are present. Bray (1937) has pointed out that these are, firstly, a family tendency to supersensitiveness, and, secondly, tissue damage following on a severe illness often pneumonic in nature, coupled in either case with a superimposed specific sensitization. In these individuals a paroxysm may be initiated by such secondary factors as reflex nasal irritation, psychic and endocrine disturbances, and non-specific factors often alimentary in origin. In the asthmatic attack there is a spasmodic constriction of the bronchial muscles

with swelling of the lining membranes of the bronchi and a thick viscid exudation, leading to dyspnoea from inadequate aeration. Asthma should be distinguished from the dyspnoea of bronchospasm, which may occur in any individual by the influence of irritants acting either locally or through the vagus nerve. Moreover, asthma should be clearly differentiated from the dyspnoea of cardiac or renal insufficiency.

Hay Fever.—In specifically sensitive individuals contact with certain pollens gives rise to a train of oculo-nasopharyngeal symptoms: (*a*) conjunctival congestion, lacrimation, and photophobia; (*b*) nasal fullness, sneezing, and a profuse watery discharge; and (*c*) pharyngeal congestion leading to coughing. More rarely the lower parts of the respiratory tract may be involved, with the production of bronchial spasm and paroxysmal dyspnoea (hay asthma). The pollen capable of producing these effects is windborne and is copiously disseminated from plants widely distributed in Nature. The seasonal incidence of hay fever in the British Isles is related to the times of pollination of some grasses in June and July, and less commonly to that of certain trees somewhat earlier. Meteorological factors such as rain, wind, and temperature determine the concentration of pollen in the atmosphere. Vasomotor rhinitis, which has many points of similarity with hay fever, has no seasonal incidence, since the specific factor may be some inhalant such as dust which is encountered all the year round. Brown Kelly (1925) has emphasized the importance of emotional disturbances in precipitating paroxysms of vasomotor rhinitis.

Cutaneous Supersensitiveness.—This may be displayed after contact with, ingestion of, or inhalation of, the specific irritant. Many of the phenomena of cutaneous supersensitiveness are analogous to the changes which follow an intradermal injection of histamine. These are, first, capillary dilatation, by direct action on the capillary wall; secondly, wheal formation, from increased capillary permeability; and, thirdly, a flush from reflex dilatation of the immediate arterioles. Urticaria and angioneurotic oedema are among the best-known members of a large and ill-understood group of cutaneous manifestations of supersensitiveness.

Miscellaneous Manifestations.—Migraine in many instances is a manifestation of supersensitiveness and, for the purposes of this paper, is the most important member of a large miscellaneous group which includes gastro-intestinal supersensitiveness and serum reactions. The mechanism of such migraine attacks has been described as a vasomotor spasm followed by secondary vascular dilatation, the first producing the symptoms of the aura and the second causing the attack itself. Pickering (1939) has pointed out that there are certain resemblances between migraine and the headache which follows an intravenous injection of histamine. The manifestations of both cutaneous supersensitiveness and migraine may be brought on by secondary factors such as have been described above, operating in an individual in whom the primary essential conditions are present. It is thus seen that supersensitiveness is protean in its manifestations, and Bray (1937) has stated that it runs in families who may compose up to 10 per cent. of the population of some countries. Bearing these facts in mind, a careful watch for supersensitiveness has been kept in hospital and private practice during recent years. Where the case history was suggestive the previous history and family history were carefully reviewed. A thorough search was made for abnormalities in nose, sinuses, throat, and chest. Group protein skin tests, with solutions prepared by Messrs C. L. Bencard (1934) Ltd., were carried out, since the specific sensitizing substances will also produce an urticarial wheal when brought into contact with the deeper layers of the epidermis.

Management of Supersensitiveness

This is discussed under five headings—general, palliative, specific, dietetic, and the treatment of complications. The management of asthma is stressed throughout, since this is the most important type of supersensitiveness and the commonest in our series of cases. In hay fever the treatment resolves itself into palliative and specific measures, while in the other forms discussed specific and dietetic measures are the most important.

General.—We have been impressed by the large number of patients with asthma who are greatly relieved immediately after admission to a hospital ward, without any specific treatment being begun. This demonstrates the importance of certain cardinal points in the general management of supersensitiveness. The patient has his own bed, in a large, airy, warm room which contains a minimum of dust-collecting furnishings, and he is relieved from anxiety and fussing, which tend to precipitate attacks. The bedding is of a simple nature, there are no eiderdowns, and loose cotton undergarments are worn.

Palliative.—During an acute attack relief can be obtained by the early injection of 2 to 5 minims of adrenaline hydrochloride solution (1 in 1,000), which may have to be repeated. This never failed during the period under observation, no case of "status asthmaticus" being encountered. As an additional measure ephedrine hydrochloride, half a grain night and morning, has been found helpful at the beginning of treatment. When bronchitis was present an antispasmodic expectorant mixture was employed, such as:

℞	Pseudo-ephedrin.	gr. j	
	Pot. iodid.	gr. v	
	Tinct. stramon.	♏ x	
	Tinct. lobel.	♏ x	
	Syr. prun. serot.	♏ x	
	Infus. seneg. ... ... ad	ʒ ij	

Sig.—ʒ ij eight-hourly.

In hay fever dark glasses and eye drops containing decicaine and adrenaline will ease the conjunctival irritation. Endrine nasal compound (mild) relieves the nasal symptoms.

Specific.—The ideal to be aimed at in treatment is the removal of the specific sensitizing factor when possible. Thus one of our patients who gave a positive reaction to the mixed inhalants solution (Group I) obtained complete and permanent relief from his asthma when his cat was disposed of, following instructions to get rid of household pets. Unfortunately the nature of the specific factor is often such that it cannot be eliminated by simple means, and desensitization has to be employed. While this may not be uniformly successful in its results, in a majority of cases it is eventually curative, provided an adequate dosage is attained. This treatment may have to be repeated at a later date if relapse occurs. Desensitization may be specific or non-specific, but only the former method has been employed in this series. As Browning (1934) puts it, this consists in administering the agent in increasing doses, those at the start being very minute. This aims at the production of abundance of circulating antibodies, so that on reaching the subject the specific factor is fixed and neutralized before it can come into contact with the tissues which are still

vulnerable. It must be remembered, however, that another explanation of the rationale of desensitization has been offered which may apply in a number of cases—namely, that the substances injected lead to exhaustion of the reactive mechanism. In this series the desensitizing solutions employed were prepared by Messrs. C. L. Bencard.

Dietetic.—It is well known that large heavy meals, especially of a high carbohydrate content, and taken in the evening, are apt to evoke some evidence of supersensitiveness. The patient quickly learns that gastric distension or a loaded colon may precipitate the onset of symptoms by reflex irritation. Purgatives which act by increasing peristalsis reflexly through the autonomic system should be avoided. Liquid paraffin or mild salines are to be preferred. As suggested by Kennedy (1936), whose diet we give below, many of our cases, especially where supersensitiveness to foods was suspected, were given a special trial diet, unlikely to contain specific sensitizing proteins. This excludes certain common articles such as eggs, raw milk, wheat, and potatoes, since these are the most frequent causes of food supersensitiveness. On this diet it was found that the responsive patient became free of symptoms in a period of about ten days, unless he happened to be one of the occasional examples of supersensitiveness to articles included in the diet, when his intake would have to be further revised. Thereafter individual foodstuffs are added at four-day intervals, and the return of symptoms looked for. The offending article or articles having been determined, these may either be excluded in every shape and form, or an attempt may be made to desensitize the patient, as described above.

Kennedy's Diet: Egg, Raw Milk, Wheat, and Potato Excluded.—Breakfast: Rye bread, thinly buttered and covered with treacle or golden syrup, grape-fruit or oranges; tea with a little condensed or well-boiled milk. 11 a.m.: Oxo or bovril, with rye bread if required. Dinner: Soup (only clear soup, Scotch broth, or chicken broth); chicken (no stuffing) or boiled fish; swedes, turnips, carrots, cabbage; fruit jellies, steamed rice, or any preserved fruit; rye bread and butter, if required; tea with a little condensed or well-boiled milk. Tea: Rye bread, thinly buttered and covered with treacle or golden syrup; any preserved fruit, tomato, lettuce; tea with a little condensed or well-boiled milk. Supper: Oxo, bovril, or tea, with rye bread if required.

Complications.—The results of treatment will be disappointing unless concomitant disease, especially in the nose and throat, has been adequately dealt with. Bray (1937) has called attention to the importance of a free airway in the nasal passages. Thus every case must be thoroughly examined for evidence of disease in sinuses, nasal mucosa, middle ear, tonsils, and adenoids. In respiratory supersensitiveness exercises may be employed to train the patient in correct methods of breathing.

Personally Observed Cases

Definite evidence of supersensitiveness was obtained in forty-three cases, which form the basis of this paper. Twenty-three of these were hospital patients, and the remainder were seen in private by one of us (J. G. G.). Twenty-seven were suffering from asthma, four had hay fever, seven urticaria, two angioneurotic oedema, and three migraine. Several patients, especially in the asthma group, showed more than one manifestation. A family history of supersensitiveness was obtained in 55 per cent., although, as has been generally noted, the type of supersensitiveness, and the causal agent, were not the same in all members of any one family. The number of cases in this series is too small to show the manner of inheritance, but it appears to be established that it is more commonly from the maternal side. The average age at onset of symptoms was eighteen years, and in 45 per cent. the onset had occurred in the first decade. No significant variations in sex incidence were observed: twenty-one of the forty-three patients were males.

It was noted that the incidence of diseases of the nose and throat was very high, especially in respiratory supersensitiveness. Tonsillectomy had been performed in sixteen cases, and there were eight examples of oto-rhinological sepsis apart from tonsillitis, while in eight additional instances thickening of the mucous membrane of the sinuses was noted. A search was always made for permanent changes in the lungs, in view of the fact that a previous history of pneumonic illness was obtained in twenty-two instances, nineteen of these being patients with respiratory supersensitiveness. While bronchitis was a frequent finding, relatively few of our cases had definite evidence of emphysema, and in only one instance was tuberculous disease of the chest found. We have been impressed by the rarity of permanent cardiac damage, although during an acute attack of asthma there must be a greatly increased load on the right heart. In this connexion Parkinson and Hoyle (1937) have stated that cardiac symptoms and signs in emphysema are more likely to be due to hypertension (systemic) than to the direct effect of emphysema on the heart. Three of our cases showed cardiac enlargement, one of them having hyperpiesis.

In all the forty-three patients the supersensitiveness was of severe degree, the average period of liability to symptoms when first seen being twelve years. The accompanying table shows that in the asthma group by far the greatest number of positive skin reactions followed testing by mixed inhalants solution, Group I (which includes feathers, horse dander and hair, cat fur, dog hair, mixed house dust, and orris). In some cases, mainly those of patients developing symptoms in the first decade, the reaction was to foodstuffs, chiefly cereals, eggs, and milk. In hay fever the predominant reaction was to pollens. In the other forms of supersensitiveness the incriminating reaction was found in the foodstuffs, although incidental reaction to inhalants was often seen.

Table showing Numbers of Strongly Positive Skin Reactions

Group Protein Skin Tests		Asthma (26 cases)	Hay Fever (4 cases)	Urticaria (7 cases)	Angio-neurotic Oedema (2 cases)	Migraine (3 cases)
Mixed inhalants	I	19	1	4	1	—
	II	5	—	—	—	—
Pollens	III	6	3	2	1	—
Cereals	III	6	—	1	—	1
Egg; milk ..	IV	4	—	3	—	1
Vegetables ..	V	1	—	2	1	—
Meats	VI	2	1	1	1	—
Fruits	VII	2	—	—	2	—
Fish	VIII	1	—	1	1	—
Shellfish	IX	2	—	1	—	1
Fabrics	X	2	—	—	—	—
Unclassified ..	XI	1	-	—	—	—

It is seen that many of the patients reacted to more than one group. Three cases of asthma showed no reaction to the skin tests, and in one case skin tests were not performed.

The patients were followed up over an average period of two and a half years. Of the twenty private cases nineteen were cured and one (an asthmatic) was not improved.

Among the hospital patients there were three cases of asthma in which treatment failed (two having heart disease and one having pulmonary tuberculosis), four were definitely improved, two could not be traced, and the remaining fourteen were cured.

Illustrative Cases

Case 1.—Asthma. A schoolboy aged 13. Family history negative. Pneumonia at 4 years of age, followed by frequent attacks of severe asthma, necessitating admission to hospital. Protein skin tests: marked reaction to mixed inhalants solution (Group I). Specific desensitization and removal of septic tonsils and adenoids. Breathing exercises employed. Patient reports two years later, without further attacks.

Case 2.—Asthma. A schoolboy aged 6. Family history positive on maternal side. Onset of asthma at 2 years of age. Attacks were frequent and complicated by bronchitis. Protein skin tests gave a marked reaction to egg-milk group. Tonsils and adenoids removed. Treatment by Kennedy's diet only, with cure after elimination of eggs. He was free from symptoms three years later.

Case 3.—Asthma. A baker aged 32. Family history negative. Severe asthma for ten years. On admission to hospital a strong reaction was obtained to mixed inhalants solutions (Groups I and II) and also cereals. Desensitization to inhalants only. He reported two years later without improvement. On reinvestigation the positive reaction to cereals was noted, and improvement followed renewed desensitization, including wheat.

Case 4.—Asthma. A single woman, at home, aged 38. Family history positive on paternal side. Frequent attacks of asthma since 2 years old. Protein skin tests: positive to rice, barley, and potatoes. Cessation of attacks on elimination of these articles from her diet. Ten years later an attack of asthma returned on taking as a tonic a vitamin B preparation obtained from rice polishings.

Case 5.—Asthma. A housewife aged 34. Family history negative. Asthmatic attacks for four years following pneumonia and pleurisy. Slight reaction to mixed inhalants solution (Group I). Sinus infection was present and antral lavage was performed. Desensitization to inhalants, without any improvement. *X*-ray examination of lungs pointed to old pulmonary tubercle, but on three examinations tubercle bacilli were not found in the sputum.

Case 6.—Hay fever. A hairdresser aged 23. Family history positive on paternal side. Severe hay fever annually since 9 years old. Skin tests: strong reaction to pollens. Pre-seasonal desensitization in three successive years, resulting in complete freedom from symptoms.

Case 7.—Angioneurotic oedema. A boy aged 8. Family history strongly positive on maternal side. Severe reactions since 5 years old following the ingestion of fish. Owing to the family history his mother rapidly noted the offending article, which was eliminated from his diet, with complete cessation of symptoms. Two severe attacks occurred at 8 years of age following the accidental ingestion of seccotine (fish glue) by finger contamination. Skin tests gave a grossly positive reaction (with lymphatic involvement) to the fish group.

Case 8.—Migraine. A housewife aged 50. Family history positive on maternal side. Bi-weekly attacks for thirty years. Skin tests strongly positive to egg-milk group. Absolute relief followed elimination of eggs from the diet.

Conclusions and Summary

Supersensitiveness is briefly described in its commoner manifestations—namely, asthma, hay fever, cutaneous and miscellaneous supersensitiveness. It is stressed that certain primary essentials are present in supersensitiveness. These are an inherited predisposition and tissue damage, coupled in either case with a superimposed specific sensitization. Authorities explain the basic reaction to the specific sensitizing substance as a liberation of a histamine-like compound, leading to smooth muscle spasm or increased capillary permeability. A reaction may be initiated in certain individuals by secondary factors—for example, psychic and endocrine disturbances.

The importance of diminishing the presence of sensitizing substances—for example, dust—is noted in the general management of supersensitiveness. Palliative measures are detailed. Group protein skin tests which may point the way to specific desensitization are advocated and the rationale of the latter is briefly discussed. Dietetic measures are of great importance in the management of supersensitiveness, and the use of a special trial diet is described. It is suggested that complications of supersensitiveness, especially in the nose and throat, be sought for and adequately treated.

Forty-three patients with supersensitiveness are analysed. Twenty-seven had asthma, four hay fever, seven urticaria, two angioneurotic oedema, and three migraine, several of the cases showing more than one manifestation. In 55 per cent. there was a family history of supersensitiveness, and in 45 per cent. the onset occurred in the first decade. There was a very high incidence of diseases of the nose and throat, especially in respiratory supersensitiveness. Bronchitis was a frequent finding, but permanent cardiac damage was rare. The results of group protein skin tests in these patients are tabulated, bringing out the great importance of inhalants as sensitizing agents. A few typical cases are briefly summarized.

On following up the results of treatment by desensitization or dieting, or both, over an average period of two and a half years, it was found that of the forty-three patients thirty-three were cured, four were improved, in four there was no success, and two were not traced. The failures were all in asthmatics who showed supersensitiveness to inhalants, whereas asthmatics who were supersensitive to foodstuffs gave a good therapeutic response.

Supersensitiveness presents a vast and fascinating problem. Great numbers of patients are subject to some of its numerous manifestations and many are in danger of drifting into chronic invalidism. This paper is an attempt to show that a large proportion of persons who have suffered severely from some of the manifestations of supersensitiveness over a long period of years may be rendered free from symptoms by adequate investigation and treatment.

Grateful thanks are due to Dr. George A. Allan, who generously provided facilities for the investigation and treatment of cases in his wards in the Western Infirmary of Glasgow; also to Professor C. H. Browning and Professor T. K. Monro for helpful advice and criticism.

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The Ministry of Health has published a pamphlet entitled "Abstract of Reports of Public Analysts for the Year 1938," which is a summary of the reports of all public analysts in England and Wales on samples submitted to them by authorities enforcing the food and drugs law. This is an annual publication, but this year it is issued a few months earlier than usual. The pamphlet, in addition to tables showing the number of samples taken in various districts and the types and number of samples of foods and drugs found to be adulterated, contains a detailed summary of the actual findings of public analysts. It may be obtained from H.M. Stationery Office at 4d., or through any bookseller.

NICOTINIC ACID IN THE TREATMENT OF DELIRIUM TREMENS

BY

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Recent developments in nutrition have fundamentally changed our views on some of the results of alcohol addiction. Formerly these disturbances were thought to be due to the toxic effects of alcohol, but it has now been demonstrated that they are for the most part signs of a nutritional deficiency (avitaminosis).

Shattuck (1928) and Minot (1929) were the first to suggest that alcoholic polyneuritis was connected with vitamin B deficiency. Proof of this was furnished by M. B. Strauss (1935), who demonstrated that "alcohol polyneuritis" could be cured if enough of the right sort of food was given, even though the consumption of alcohol remained unchanged. Spies and De Wolf (1933) showed that pellagra in alcohol addicts could be treated successfully in the same way. Treatment of alcoholic polyneuritis with thiamin has since been successful (Goodhart and Joliffe, 1938). According to this conception deficiency of thiamin causes polyneuritis, and lack of nicotinic acid pellagra. In alcohol addiction both conditions are the result of general malnutrition. Moreover, injury to the intestinal mucous membrane and to the liver may lead to further reduction of vitamin absorption, as is probable in certain cases of secondary pellagra occurring in connexion with intestinal diseases (Thaysen, 1932).

Consumption of alcohol probably also increases, as do carbohydrates, the requirement of vitamin B_1 (Cowgill, 1934). The supply of maize or semolina increases the requirement of the protective substance against pellagra (P.P. factor), thus indirectly favouring the production of the disease (Chick, 1933). It has been shown in animal experiments that degenerative processes of the central nervous system from vitamin A deficiency are furthered by excess of carbohydrates; similar factors may play a part in ergotism and lathyrism (E. Mellanby, 1934). Mellanby accordingly suggested that there is an antagonism between "toxamin" and "vitamin." It might be worth while to investigate on these lines the causation of the results of alcoholism.

Acute drunkenness justifies the older idea of a direct toxic effect of alcohol on the central nervous system. But in view of the conditions described above it was thought possible that in delirium tremens there might be deficiency of one of the vitamins of the B group. One case in which this idea was tested we record because the result was most convincing and because our opportunities are limited, as severe alcoholism is comparatively rare in Egypt.

Case History

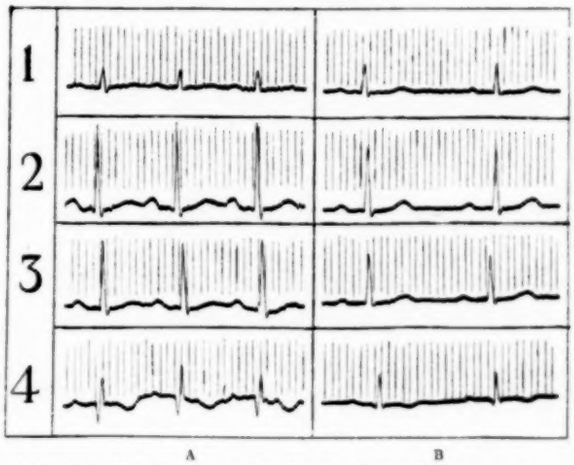
The patient was an office manager aged 37, and was in hospital from January 8 to 20, 1939. For one year he had been suffering from diarrhoea. During 1938 he was twice admitted because of short attacks of intestinal catarrh, with temperature. For several years he took ten glasses of whisky or more a day. Six months previously he had experienced a slight attack of delirium tremens, which persisted for four days. He had delusions that the King of England and other important persons appeared in his office. Outwardly his behaviour had been normal, but he soon developed acoustic and visual hallucinations. He became excited, was unable to sleep, and finally had to be taken to hospital. There the condition was not considered serious, and after two days he was dismissed. There had been retrograde amnesia for the period of the delirium. Since that time he has often suffered from attacks of intestinal catarrh, which have forced him to keep a strict diet for several days. But apart from this he had felt well and had been able to work regularly.

Since Christmas, 1938, he had drunk at least one bottle of whisky daily, and now lost his appetite completely. Eight days before admission to hospital the following was the state of affairs.

ATTACK OF DELIRIUM

To begin with there was a slight fever, which soon subsided, leaving cough with expectoration. This was followed by a sudden onset of severe pain in the "stomach," independent of food, which persisted for two or three days. Severe vomiting then set in, which made it almost impossible for him to take food or fluids. He complained of bad headache and burning of mouth and tongue. These gastro-intestinal disturbances persisted for five days, at the end of which psychic manifestations similar to those in the first attack, but worse, appeared. He saw small animals running across the bedspread and tried to catch them. He also believed there were animals hidden in the cupboard. He suffered from insomnia and often woke in terror. In an increasing degree he confused his environment, murmured incomprehensible words, and became altogether inaccessible. The excitement increased, and it was only with difficulty that he could be kept in bed. Vomiting now became uncontrollable; he refused all food, and vomited after taking fluids. There was either diarrhoea or constipation. After this condition had persisted for three days it was decided to take the patient to hospital.

On admission he was so excited that he had to be kept in bed by force. He constantly tried, with coarsely trembling movements, to catch imaginary animals on the bedspread, to sign papers which were not there, and to defend himself from imagined attackers with sudden punches. Now and then he answered questions. He had incontinence of urine. Physical examination revealed severe stomatitis and gingivitis, several superficial sores of the buccal mucous membrane and the palate, and marked emaciation. The consistency of the skin was normal. There was no anaemia. The tendon reflexes were exaggerated. No signs of neuritis were observed, but even in repose there was tremor, increasing and becoming coarser by movements. The temperature varied around 38° C., the pulse rate was 100 to 110 per minute, and the blood pressure 120/80 mm. Hg. The electrocardiogram taken at the end of the delirium (previously this was impossible) showed unmistakable abnormalities compared with one taken four days later. There was deformation of $S\text{-}T_{II}$ and $S\text{-}T_{III}$ as well as practical disappearance of T_I. The two electrocardiograms are shown in the illustration; in the table the characteristic data are given.



Electrocardiograms: A, immediately after delirium; B, four days after

* IVF, taken in such a way that normally the T wave is negative.

Among the hospital patients there were three cases of asthma in which treatment failed (two having heart disease and one having pulmonary tuberculosis), four were definitely improved, two could not be traced, and the remaining fourteen were cured.

Illustrative Cases

Case 1.—Asthma. A schoolboy aged 13. Family history negative. Pneumonia at 4 years of age, followed by frequent attacks of severe asthma, necessitating admission to hospital. Protein skin tests: marked reaction to mixed inhalants solution (Group I). Specific desensitization and removal of septic tonsils and adenoids. Breathing exercises employed. Patient reports two years later, without further attacks.

Case 2.—Asthma. A schoolboy aged 6. Family history positive on maternal side. Onset of asthma at 2 years of age. Attacks were frequent and complicated by bronchitis. Protein skin tests gave a marked reaction to egg–milk group. Tonsils and adenoids removed. Treatment by Kennedy's diet only, with cure after elimination of eggs. He was free from symptoms three years later.

Case 3.—Asthma. A baker aged 32. Family history negative. Severe asthma for ten years. On admission to hospital a strong reaction was obtained to mixed inhalants solutions (Groups I and II) and also cereals. Desensitization to inhalants only. He reported two years later without improvement. On reinvestigation the positive reaction to cereals was noted, and improvement followed renewed desensitization, including wheat.

Case 4.—Asthma. A single woman, at home, aged 38. Family history positive on paternal side. Frequent attacks of asthma since 2 years old. Protein skin tests: positive to rice, barley, and potatoes. Cessation of attacks on elimination of these articles from her diet. Ten years later an attack of asthma returned on taking as a tonic a vitamin B preparation obtained from rice polishings.

Case 5.—Asthma. A housewife aged 34. Family history negative. Asthmatic attacks for four years following pneumonia and pleurisy. Slight reaction to mixed inhalants solution (Group I). Sinus infection was present and antral lavage was performed. Desensitization to inhalants, without any improvement. *X*-ray examination of lungs pointed to old pulmonary tubercle, but on three examinations tubercle bacilli were not found in the sputum.

Case 6.—Hay fever. A hairdresser aged 23. Family history positive on paternal side. Severe hay fever annually since 9 years old. Skin tests: strong reaction to pollens. Pre-seasonal desensitization in three successive years, resulting in complete freedom from symptoms.

Case 7.—Angioneurotic oedema. A boy aged 8. Family history strongly positive on maternal side. Severe reactions since 5 years old following the ingestion of fish. Owing to the family history his mother rapidly noted the offending article, which was eliminated from his diet, with complete cessation of symptoms. Two severe attacks occurred at 8 years of age following the accidental ingestion of seccotine (fish glue) by finger contamination. Skin tests gave a grossly positive reaction (with lymphatic involvement) to the fish group.

Case 8.—Migraine. A housewife aged 50. Family history positive on maternal side. Bi-weekly attacks for thirty years. Skin tests strongly positive to egg–milk group. Absolute relief followed elimination of eggs from the diet.

Conclusions and Summary

Supersensitiveness is briefly described in its commoner manifestations—namely, asthma, hay fever, cutaneous and miscellaneous supersensitiveness. It is stressed that certain primary essentials are present in supersensitiveness. These are an inherited predisposition and tissue damage, coupled in either case with a superimposed specific sensitization. Authorities explain the basic reaction to the specific sensitizing substance as a liberation of a histamine-like compound, leading to smooth muscle spasm or increased capillary permeability. A reaction may be initiated in certain individuals by secondary factors—for example, psychic and endocrine disturbances.

The importance of diminishing the presence of sensitizing substances—for example, dust—is noted in the general management of supersensitiveness. Palliative measures are detailed. Group protein skin tests which may point the way to specific desensitization are advocated and the rationale of the latter is briefly discussed. Dietetic measures are of great importance in the management of supersensitiveness, and the use of a special trial diet is described. It is suggested that complications of supersensitiveness, especially in the nose and throat, be sought for and adequately treated.

Forty-three patients with supersensitiveness are analysed. Twenty-seven had asthma, four hay fever, seven urticaria, two angioneurotic oedema, and three migraine, several of the cases showing more than one manifestation. In 55 per cent. there was a family history of supersensitiveness, and in 45 per cent. the onset occurred in the first decade. There was a very high incidence of diseases of the nose and throat, especially in respiratory supersensitiveness. Bronchitis was a frequent finding, but permanent cardiac damage was rare. The results of group protein skin tests in these patients are tabulated, bringing out the great importance of inhalants as sensitizing agents. A few typical cases are briefly summarized.

On following up the results of treatment by desensitization or dieting, or both, over an average period of two and a half years, it was found that of the forty-three patients thirty-three were cured, four were improved, in four there was no success, and two were not traced. The failures were all in asthmatics who showed supersensitiveness to inhalants, whereas asthmatics who were supersensitive to foodstuffs gave a good therapeutic response.

Supersensitiveness presents a vast and fascinating problem. Great numbers of patients are subject to some of its numerous manifestations and many are in danger of drifting into chronic invalidism. This paper is an attempt to show that a large proportion of persons who have suffered severely from some of the manifestations of supersensitiveness over a long period of years may be rendered free from symptoms by adequate investigation and treatment.

Grateful thanks are due to Dr. George A. Allan, who generously provided facilities for the investigation and treatment of cases in his wards in the Western Infirmary of Glasgow; also to Professor C. H. Browning and Professor T. K. Monro for helpful advice and criticism.

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The Ministry of Health has published a pamphlet entitled "Abstract of Reports of Public Analysts for the Year 1938," which is a summary of the reports of all public analysts in England and Wales on samples submitted to them by authorities enforcing the food and drugs law. This is an annual publication, but this year it is issued a few months earlier than usual. The pamphlet, in addition to tables showing the number of samples taken in various districts and the types and number of samples of foods and drugs found to be adulterated, contains a detailed summary of the actual findings of public analysts. It may be obtained from H.M. Stationery Office at 4d., or through any bookseller.

NICOTINIC ACID IN THE TREATMENT OF DELIRIUM TREMENS

BY

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AND

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Recent developments in nutrition have fundamentally changed our views on some of the results of alcohol addiction. Formerly these disturbances were thought to be due to the toxic effects of alcohol, but it has now been demonstrated that they are for the most part signs of a nutritional deficiency (avitaminosis).

Shattuck (1928) and Minot (1929) were the first to suggest that alcoholic polyneuritis was connected with vitamin B deficiency. Proof of this was furnished by M. B. Strauss (1935), who demonstrated that "alcohol polyneuritis" could be cured if enough of the right sort of food was given, even though the consumption of alcohol remained unchanged. Spies and De Wolf (1933) showed that pellagra in alcohol addicts could be treated successfully in the same way. Treatment of alcoholic polyneuritis with thiamin has since been successful (Goodhart and Joliffe, 1938). According to this conception deficiency of thiamin causes polyneuritis, and lack of nicotinic acid pellagra. In alcohol addiction both conditions are the result of general malnutrition. Moreover, injury to the intestinal mucous membrane and to the liver may lead to further reduction of vitamin absorption, as is probable in certain cases of secondary pellagra occurring in connexion with intestinal diseases (Thaysen, 1932).

Consumption of alcohol probably also increases, as do carbohydrates, the requirement of vitamin B_1 (Cowgill, 1934). The supply of maize or semolina increases the requirement of the protective substance against pellagra (P.P. factor), thus indirectly favouring the production of the disease (Chick, 1933). It has been shown in animal experiments that degenerative processes of the central nervous system from vitamin A deficiency are furthered by excess of carbohydrates; similar factors may play a part in ergotism and lathyrism (E. Mellanby, 1934). Mellanby accordingly suggested that there is an antagonism between "toxamin" and "vitamin." It might be worth while to investigate on these lines the causation of the results of alcoholism.

Acute drunkenness justifies the older idea of a direct toxic effect of alcohol on the central nervous system. But in view of the conditions described above it was thought possible that in delirium tremens there might be deficiency of one of the vitamins of the B group. One case in which this idea was tested we record because the result was most convincing and because our opportunities are limited, as severe alcoholism is comparatively rare in Egypt.

Case History

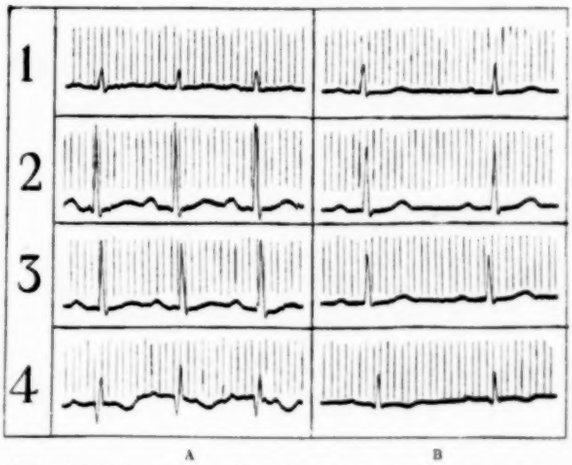
The patient was an office manager aged 37, and was in hospital from January 8 to 20, 1939. For one year he had been suffering from diarrhoea. During 1938 he was twice admitted because of short attacks of intestinal catarrh, with temperature. For several years he took ten glasses of whisky or more a day. Six months previously he had experienced a slight attack of delirium tremens, which persisted for four days. He had delusions that the King of England and other important persons appeared in his office. Outwardly his behaviour had been normal, but he soon developed acoustic and visual hallucinations. He became excited, was unable to sleep, and finally had to be taken to hospital. There the condition was not considered serious, and after two days he was dismissed. There had been retrograde amnesia for the period of the delirium. Since that time he has often suffered from attacks of intestinal catarrh, which have forced him to keep a strict diet for several days. But apart from this he had felt well and had been able to work regularly.

Since Christmas, 1938, he had drunk at least one bottle of whisky daily, and now lost his appetite completely. Eight days before admission to hospital the following was the state of affairs.

ATTACK OF DELIRIUM

To begin with there was a slight fever, which soon subsided, leaving cough with expectoration. This was followed by a sudden onset of severe pain in the "stomach," independent of food, which persisted for two or three days. Severe vomiting then set in, which made it almost impossible for him to take food or fluids. He complained of bad headache and burning of mouth and tongue. These gastro-intestinal disturbances persisted for five days, at the end of which psychic manifestations similar to those in the first attack, but worse, appeared. He saw small animals running across the bedspread and tried to catch them. He also believed there were animals hidden in the cupboard. He suffered from insomnia and often woke in terror. In an increasing degree he confused his environment, murmured incomprehensible words, and became altogether inaccessible. The excitement increased, and it was only with difficulty that he could be kept in bed. Vomiting now became uncontrollable; he refused all food, and vomited after taking fluids. There was either diarrhoea or constipation. After this condition had persisted for three days it was decided to take the patient to hospital.

On admission he was so excited that he had to be kept in bed by force. He constantly tried, with coarsely trembling movements, to catch imaginary animals on the bedspread, to sign papers which were not there, and to defend himself from imagined attackers with sudden punches. Now and then he answered questions. He had incontinence of urine. Physical examination revealed severe stomatitis and gingivitis, several superficial sores of the buccal mucous membrane and the palate, and marked emaciation. The consistency of the skin was normal. There was no anaemia. The tendon reflexes were exaggerated. No signs of neuritis were observed, but even in repose there was tremor, increasing and becoming coarser by movements. The temperature varied around 38° C., the pulse rate was 100 to 110 per minute, and the blood pressure 120/80 mm. Hg. The electrocardiogram taken at the end of the delirium (previously this was impossible) showed unmistakable abnormalities compared with one taken four days later. There was deformation of $S\text{-}T_{II}$ and $S\text{-}T_{III}$ as well as practical disappearance of T_1. The two electrocardiograms are shown in the illustration; in the table the characteristic data are given.



Electrocardiograms: A, immediately after delirium; B, four days after

* IVF, taken in such a way that normally the T wave is negative.

Table showing the Characteristics of the Electrocardiograms

	Date	Frequency per Minute	Voltage in Millimetres*			Duration in Seconds		
			RS_1	RS_2	RS_3	PQ	QRS	ST
No. 1	Jan. 11, 1939	109	6	23	21	0.19	0.07	0.25
No. 2	Jan. 15, 1939	68	8	17	13	0.20	0.08	0.34

* 10 millimetres = 1 mv

Nothing abnormal was found in the urine, and as most of it was passed into the bed it was impossible to obtain sufficient to test for porphyrinuria.

TREATMENT

In addition to symptomatic treatment with scopolamine, without much benefit, and subcutaneous administration of fluids, we also gave vitamin B_1. The patient received a total of 0.55 gramme of thiamin, partly intramuscularly, partly intravenously, over a period of two days. There was no improvement; on the contrary, his excitement and confusion were rather increased. One night he was given 0.5 gramme of nicotinic acid by mouth, having already had 0.1 gramme the previous day. Within twelve hours the change that took place was most striking. Whereas the patient had not slept for six days, he now fell into a sound sleep for three hours. When he awoke he was absolutely clear, remained quietly in bed, talked, smoked, ate, and drank without vomiting. During the following three days the stomatitis disappeared, leaving only slight traces, and temperature as well as pulse rate returned to normal. He showed astonishing appetite and thirst: he took three similar meals in quick succession and drank several bottles of sweet grape-juice. In the course of two days his body weight increased from 54.3 kg. to 58 kg., and after two more days to 60 kg.; this was probably partly due to compensation of the previous dehydration. The patient did not remember the events before and after his admission to hospital.

Comment

In a case of severe chronic alcoholism an insignificant cold apparently gave rise to a gastro-intestinal syndrome with stomatitis and, subsequently, typical delirium tremens. Large doses of vitamin B_1 were without effect; but nicotinic acid, in doses recommended for the treatment of pellagra, made all pathological manifestations disappear within twelve hours.

An acute gastro-intestinal syndrome (of scarcely infectious origin) and stomatitis (with glossitis), after a preceding period of increased abuse of alcohol, in this case made an aetiological connexion with pellagra probable. In view of the electrocardiographic findings of Feil (1936) in pellagra and of Keefer (1930) and Wenckebach (1934) in beriberi, the transitory changes of the electrocardiogram, which cannot be explained in another way, should be considered as due to avitaminosis. The prompt response to the treatment with nicotinic acid confirms this assumption, since previously for ten days the condition had steadily deteriorated.

Summary

In a chronic whisky addict an attack of delirium tremens (recurrence) associated with severe gastro-intestinal manifestations and acute stomatitis was made to disappear within twelve hours by the administration of nicotinic acid. Previous to this thiamin had been given in large doses, but without any perceptible result. The prompt response to nicotinic acid favours the assumption that lack of this vitamin is an important factor in the development of delirium tremens.

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HAEMATEMESIS AND MELAENA

OBSERVATIONS ON SALT AND WATER REQUIREMENTS

BY

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An examination of the post-mortem records of fatal cases of haemorrhage from simple peptic ulceration at St. Bartholomew's Hospital (1931–5) revealed data which indicated that in eighteen out of thirty-nine cases the haemorrhage had ceased at the time of death and that many had not bled for some days previously. If the mortality from haematemesis is to be reduced, obviously this group offers the most hope. It has, therefore, been studied to see if other factors were present that might have led to the death of these patients, which occurred from one to three weeks after admission. The evidence suggests that dehydration may have played an important part.

In seven of these cases the blood or cerebrospinal fluid urea was determined at death and all showed uraemia, the readings being 860, 710, 640, 380, 368, 330, and 272 mg. per 100 c.cm. A clue must lie in the cause of this uraemia, which was not due to chronic nephritis; for, except in one case, the kidneys did not show sufficient changes to account for the azotaemia. It is felt that an analysis of these seven cases may throw light on the cause of delayed death after haematemesis and melaena.

It is improbable that these patients died of anaemia. The haemoglobin shortly before death was 82, 77, 64, 56, and 40 per cent. in five cases, and in the others 63 and 49 per cent. two days before death. Even allowing for concentration of blood due to dehydration, the loss of haemoglobin should not have been sufficient to cause death from anoxaemia. In two cases only was there evidence of fairly recent haemorrhage. Nor were they old enfeebled people, for five were under 50 and one was only 28. They died with uraemia on the eighth, eighth, tenth, eleventh, thirteenth, thirteenth, and sixteenth day after admission. It is well known that gastro-duodenal haemorrhage is followed by an elevation of the blood urea, as was first reported by Sanguinetti (1934), but personal observation, to be published shortly, on seventy cases has shown that when the patients received a liberal fluid allowance, and had not had alkalosis or a prolonged period of shock, the blood urea did not rise above 150 mg. per 100 c.cm.—seldom being above 100 mg.—and returned to normal within a few days. Except with dehydration, prolonged shock, or alkalosis (283, 256, 160 mg. per 100 c.cm.), no figures approaching the above cases have been found during the last four years, and this must be

explained by the difference in treatment. Previously the fluid intake was much restricted and alkalis were given, in which circumstances it must have been an almost impossible task for the body to maintain its acid-base equilibrium. Alkalosis, however, was not a constant factor in causing the uraemia, for in three of the above cases no alkalis were given.

Dehydration

It seems that dehydration was the one common factor. An estimate of the fluid balance in these seven cases showed that there was a negative balance of approximately 4,500, 4,500, 5,000, 6,500, 6,500, 7,000, and 9,000 c.cm. plus the initial blood lost and the water content of the stools. This is confirmed in some cases by the references to dehydration in the notes and the post-mortem records. Such figures do not seem fantastic when it is remembered that a patient has already lost 6 per cent. of his body weight (3,800 c.cm. for a patient of 10 stone) when he shows signs of dehydration (Maddock and Coller, 1937). The discomfort and thirst were tolerated only by the liberal administration of morphine and hyoscine. It is of importance to note that at death three of the patients with extreme dehydration had an acute enterocolitis, with colonic ulceration in two cases, one of which perforated terminally. This type of colonic ulceration is known to occur in uraemia.

With starvation there is breakdown of body proteins, and, as renal function is depressed by lack of water, dehydration rapidly leads to uraemia and death (Brandberg, 1929; Meyler, 1936). The astronomical figures reached in these cases must be the result of a combination of the uraemia due to dehydration with the much-increased production of urea from the digestion of the blood in the intestine. This will be discussed in detail in a further paper.

The patients became dehydrated because the routine treatment provided insufficient fluids. The modified Lenhartz diet, by which these patients were treated, allowed ten two-hourly milk or milk-and-egg feeds of 1 oz., 1½ oz., 2 oz., 2½ oz., and 3 oz. on the first five days respectively, but in practice equal feeds of water were given between them. Even so, the patients received only 600, 900, 1,200, 1,500, 1,800 c.cm. respectively during the first five days. Two rectal salines of 300 c.cm. were allowed daily, but were given part of the time to two only out of the seven cases. When the patients were most in need of fluid, after a recurrent haemorrhage, they were returned to the beginning of the scale.

A normal person needs at least 2,600 c.cm. of available water a day, and his fluid balance may be represented thus (Starling, 1936):

Intake		Output	
Fluids	1,450 c.cm.	Urine	1,500 c.cm.
Water content of solid foods	800 c.cm.	Skin	600 c.cm.
Water of oxidation	350 c.cm.	Lungs	400 c.cm.
		Faeces	100 c.cm.
Total	2,600 c.cm.	Total	2,600 c.cm.

It is obvious that the modified Lenhartz regime allowed grossly insufficient water for a normal person, and still more so for a patient who has lost one to three litres of blood. The patient was at a serious disadvantage, for the strictly limited water intake was not augmented by the water content of solid foods or by water of oxidation, as the diet was of little caloric value. Perhaps the most serious consequence to the patient was the forced diuresis which seems to occur after gastro-duodenal haemorrhage. Almost constantly it was noticed that the urine output exceeded the fluid intake for several days after a gastro-duodenal haemorrhage, and this must have distracted attention from the dehydration, for oliguria is supposed to be one of its initial signs. This forced diuresis is seen in the following particulars of a case.

Days:	1	2	3	4	5
	c.cm.	c.cm.	c.cm.	c.cm.	c.cm.
Fluid intake: By mouth	340	600	200	600	1,050
Per rectum	—	—	900	1,500	—
Urine	725	1,450	1,350+	1,150	1,200+

Record on Chart

First day.—First day modified Lenhartz (300 c.cm.) plus 4 c.cm. water between feeds.

Second day.—First day modified Lenhartz plus 30 c.cm. water between feeds.

Third day.—Sips of water only (8 c.cm. hourly).

Fourth day.—First day modified Lenhartz with 30 c.cm. water between feeds.

Fifth day.—Second day modified Lenhartz (450 c.cm.) with 60 c.cm. of water between feeds.

The patient had alkaline powder six times a day; this may have slightly increased the fluid intake. He died with hyperpyrexia on the seventh day. An obvious explanation of this case is that the intake figures are incorrect, but they are vouched for by written instructions and by a careful ward sister.

This forced diuresis is probably the result of the increased excretion of urea which occurs for several days after gastro-duodenal haemorrhage, and is well illustrated by the following recent case.

Days:	1	2	3	4	5
Urine urea %	4.2	3.1	1.85	2.1	1.75
Urea output per day (grammes)	72.0	46.0	46.0	29.6	21.5

This finding has been confirmed in twenty cases, and it seems that the urea output is roughly proportional to the fall in the haemoglobin. The excess of urea output is probably derived from the digestion of blood in the intestine. If all the protein in two litres of blood were digested the liver might produce over 100 grammes of urea. Urea is a good diuretic, and this must have much accentuated the difficulties of the patient in maintaining his water balance. Normally the insensible loss of moisture from the skin and lungs is 860 c.cm. a day, but varies with the metabolic rate (Benedict and Benedict, 1927). This figure has been used in estimating the water balance of these cases. It represents the water vapour lost with expired air and by evaporation from the skin, independently of sweat-gland activity. With sweating this figure is much increased. Recent cases of haematemesis and melaena treated by liberal fluids have shown that the loss from the skin and lungs is apparently between 1,200 and 1,600 c.cm. a day.

A regime which results in a negative fluid balance of 4,500 to 9,000 c.cm. is surely one which even a stout, healthy constitution would have difficulty in withstanding, and must be disastrous for an exsanguinated patient who may have already lost one or two stone in weight as a result of peptic ulceration. It is suggested that part of the mortality in the past has been due to the effects of dehydration. It is maintained that patients should be given

at least 2,700 c.cm. of fluid a day if semi-solids are allowed, and 3,000 c.cm. if fluids alone are given. Water should be regarded as second only to oxygen in importance, and an adequate intake as more important than medicine or food.

Having had personal experience of fifty cases of haemorrhage from simple peptic ulceration treated with liberal fluids and semi-solids (Witts's (1937) modification of the Meulengracht regime), and having seen many patients treated on the traditional starvation lines, I am convinced that with an adequate fluid intake they are more comfortable, and are free from thirst and hunger. They have not become delirious or developed parotitis or pneumonia. With the Witts diet, patients receive as much in one day as they would previously have received in three to six days, when no added saline was given. There appears to be no harm in giving liberal fluids by mouth from the time of haemorrhage, but the incidence of recurrent haemorrhage (thirteen out of fifty cases) has probably not diminished. The mortality, however, has much decreased. In a series of fifty cases recently reported, treated by liberal fluids and semi-solids, with drip transfusion in severe cases, there was only one death (Avery Jones, 1939).

The observation that many patients were grossly dehydrated must cast doubt on any conclusions which have been made concerning small blood transfusions in the past. The patients probably died with a low blood volume as a result of haemorrhage and dehydration, but it might have been restored by giving liberal fluids. Although blood transfusions could only have been beneficial, the patients were more in need of 4,500 to 9,000 c.cm. of fluid than of small transfusions of blood. Transfused blood does not provide fluid to be lost from the kidneys, skin, and lungs, for which at least 2,600 c.cm. of water a day are normally required, a figure which must be increased if there is sweating, fever, vomiting, or diarrhoea.

Salt Requirements after Gastro-duodenal Haemorrhage

Not only must there be an adequate fluid intake, but the amount of salt required is of importance. Sodium is the main base of the extracellular fluids, and it maintains their osmotic pressure. If such fluids are lost from the body—for example, by haematemesis—the total volume of the extracellular fluids cannot be regained unless sodium as well as water be given. Blood contains 5 grammes of sodium chloride per litre, so that, if no blood transfusion be given, additional salt is required to make good this loss and to enable the volume of the extracellular fluids to be restored. Analysis of the urine in twenty cases has indeed shown that there is some retention of sodium chloride during the first few days after haemorrhage. In the past, patients received very little salt, unless a rectal saline was given. It is recommended that the diet should contain about 10 grammes of sodium chloride during the first few days. By giving 1,500 c.cm. of half-strength normal saline daily, and added salt with the feeds, this intake is assured.

Summary

Examination of the post-mortem records showed that many cases of haematemesis and melaena have ended fatally when it appeared that haemorrhage had ceased.

An analysis indicates that severe dehydration was the common factor in such patients, and that symptoms were masked by the liberal administration of opiates. The dehydration was due partly to insufficient fluid intake and partly to a forced diuresis. The latter was probably the result of a much increased excretion of urea, presumably derived from the digestion of blood in the intestine.

It should be axiomatic that patients should receive enough fluid to meet the normal requirements of the kidneys, skin, and lungs, and to cover any abnormal fluid loss. In addition, it is recommended that they should be given 10 grammes of sodium chloride daily during the first few days after the haemorrhage.

I wish to thank Professors R. V. Christie, F. R. Fraser, and L. J. Witts, and Drs. G. Graham, Geoffrey Evans, and Bodley Scott for their kind criticism and advice.

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A SERIES OF 200 CASES OF OESOPHAGOSCOPY FOR FOREIGN BODIES

BY

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At the Manchester Royal Infirmary all cases of foreign bodies in the oesophagus are treated as urgencies, and an oesophageal examination is undertaken as soon as their presence has been verified by *x*-ray examination. An oesophagoscopy is made in all cases in which the radiographer is unable to give an absolutely negative report, and it is obvious that this is sometimes a matter of great difficulty in the case of non-opaque foreign bodies. In a proportion of cases where there was a history of swallowing some bone or other non-opaque body the radiographer reported the presence of "a residual barium flake, suggesting the presence of a foreign body." Many cases of this type are of course negative, but a foreign body is found in a number large enough to justify a routine examination when such a report is the most definite one can obtain. In several cases a scratch was found in the oesophagus in the position indicated by the radiograph, and no doubt was responsible for the "residual flake."

In thirteen cases of this series (Table I) the examination was undertaken for complete oesophageal obstruction caused by an impacted bolus of food: in three of these a bone was found in the bolus, and in two others it had been arrested by a carcinoma of the oesophagus. In one case a bone was found impacted in a fibrous structure. In all these cases the methods and instruments introduced by Professor Chevalier Jackson were used, with the exception that a general anaesthetic was given.

In 180 of the 200 consecutive cases here summarized a foreign body was found and removed; in six the foreign body was seen and identified but owing to misadventure was missed and passed into the stomach; in thirteen cases the examination was negative; and in one case the foreign body was seen but was immovable. In all instances where a foreign body was lost, or when the oesophagoscopy

proved negative, further radiographs were taken for verification. In two cases a second oesophagoscopy was necessary to remove a foreign body which was not seen at the first examination. One of these bodies was a halfpenny in a child of 6 years; in this case the radiograph showed the coin at the sixth cervical vertebra, but the second showed it at the eighth dorsal. The body in the other case was a large fish-bone at the fourth dorsal vertebra; here so much bleeding occurred that the examination was postponed for forty-eight hours, when the bone was removed, recovery being uninterrupted. The age incidence and the position of the foreign body are given in Table II.

TABLE I.—*Results in the Series (200 Cases)*

Foreign Bodies	No. Removed	Foreign Bodies Seen but Lost	No Foreign Body Seen
Bones	81	2 (second radiograph negative)	8 (second radiograph negative)
Coins	65	2 (second radiograph, shown in stomach)	3 (second radiograph, shown in alimentary canal)
Food bolus (simple 8, with bone 3, with carcinoma 2)	13		
Dentures	10	1 (seen but immovable)	
Safety-pins	2		1 (pin in left iliac fossa—passed naturally)
Straight pins	1		
Drawing-pins	1		
Needles	2		
Wrist watch	1		
Razor blade	1		
Identity disk	1		
Metal badge	1		
Key	1		
Aeroplane model		1 (second radiograph, shown in bowel)	
Bone button			1 (second radiograph negative)
Circular whistle		1 (second radiograph, shown in stomach)	
Total	180	7	13

TABLE II.—*Situation and Age Incidence (Males, 95; Females, 105)*

Situation	No.	Age Group	No.
C6–C7	63	1–5 years	31
D1–D2	81	6–10 „	34
D3–D4	29	10–20 „	29
D5–D6	15	20–30 „	18
D7–D10	12	30–40 „	22
		40–50 „	26
		50–60 „	19
		Over 60 years	21
	200		200

The following is a report of the two deaths in the series.

1. In this case an impacted denture could not be removed at all owing to a sharp hook which had perforated the oesophagus. Mr. Graham Bryce was consulted and suggested an attempt to remove it by oesophagotomy. He performed the first stage, but owing to the patient's condition was unable to complete the operation. Death was due to mediastinitis.

2. This case has already been reported in the *Journal of Laryngology*. A woman gave a history of having swallowed a beef bone three days before admission. *X*-ray examination showed the presence of a foreign body at the level of D3–D4. On examination no bone was seen, but there was some bleeding at the level indicated. Two further radiographs were taken in the next few days, each followed by a negative oesophagoscopy. Mr. Lindley Sewell was then asked to examine the patient, which he did, with the same negative result. Shortly after the last radiograph, which was negative, the patient produced a bone about one and a half inches long and a quarter of an inch in width, which she said she had coughed up. Her condition gradually became worse, and she died with cerebral symptoms. At necropsy a perforation was found in the oesophagus at the level of the third dorsal vertebra; there was necrosis of the vertebra, spinal meningitis in that region, and extensive basal meningitis. No foreign body was seen.

Summary

At the Manchester Royal Infirmary all cases of foreign bodies in the oesophagus are treated as urgencies, and oesophagoscopy is employed in all cases in which the radiographer is unable to give an absolutely negative report.

Of 200 consecutive cases here summarized a foreign body was found and removed in 180. In two cases a second oesophagoscopy was necessary.

Two deaths occurred in the series: each of these cases is reported in brief.

Details are given of the foreign bodies removed, their situation, and the age groups of the patients.

Clinical Memoranda

Laryngeal Vertigo occurring in a Case of Aneurysm of the Aorta

Adams reviews the literature of laryngeal vertigo in the *British Medical Journal* (1936, **1**, 685), and concludes that this condition is not a definite clinical entity. It is found in association with many different conditions, and one is forced to the conclusion that coughing of any origin may be the causal factor. The following case scarcely meets the requirements of Charcot's original description of "laryngeal vertigo," which suggested that this term should be restricted to cases in which the loss of consciousness appears independently of the passive congestion brought about by the cough, but most modern writers are willing to accept a somewhat looser definition and are prepared to accept as examples of "laryngeal vertigo" any case in which coughing is followed by a temporary loss of consciousness.

CASE RECORD

A man aged 56, unemployed for many years, was admitted to the Southern General Hospital on January 21, 1938, complaining of several attacks of brief unconsciousness occurring during the previous six months. The history elicited was that about six months before admission, while sitting at table one morning, he felt a tickling in the throat, followed by coughing and slight giddiness, and fell backwards, losing consciousness. Five or six similar attacks occurred after this at intervals of weeks. Each attack took place in the morning while he was sitting at table, and each time he fell backwards and lost consciousness. On every occasion tickling in the throat was first experienced, then severe coughing and a feeling of choking took place; next he felt slightly giddy, and finally fell unconscious. Giddiness was felt only with the bouts of severe coughing which preceded loss of consciousness. The periods of unconsciousness (as reported by onlookers) were brief, lasting one to two minutes, there were no involuntary movements of any part of the body before or during them, and after each he felt vaguely unwell for the remainder of the day.

The patient had had bouts of coughing with slight frothy expectoration for two years before admission: coughing occurred, as a rule, in the mornings. He had suffered from increasing dyspnoea, but no pain in the chest, on exertion for some months, and altogether felt himself deteriorating in general health. He was a moderate tobacco smoker, his consumption of alcohol was slight, and his previous health had been good, apart from minor accidents.

Examination showed a sallow, undersized, poorly developed man of medium nutrition, weighing a little over 7 stone, with pronounced double genu valgum. The apex beat was palpable in the sixth interspace, 5½ inches from the mid-sternum. Pulsation of the chest wall below the inner end of the clavicle was visible in the second left interspace, while movement, systolic in time and sustained, of the manubrium sterni was also visible. Dullness on percussion was noted behind the sternum and for 1/2 inch to the left and 1 inch to the right of it in the first and second interspaces. Aortic pulsation could be easily felt in the episternal notch. A bruit, systolic in time, was audible in the aortic area, being propagated down the right side of the sternum and towards the apex. The palpable arteries showed evidence of fairly well-marked arteriosclerosis. The radial pulse was difficult to feel in the left wrist, but was easily felt in the right. The blood pressure was: left arm 74/42, right arm 124/80. The pupils showed no abnormality, but ophthalmoscopic examination revealed definite signs of arteriosclerosis. On examination of the other systems, including the ears, nose, and throat, no abnormalities were seen, apart from mild chronic catarrh of both ears. The urine was free of abnormal constituents.

X-ray examination revealed no abnormality of the skull, but showed definite aneurysmal dilatation of the ascending aorta, with considerable enlargement of the heart; the lungs were normal. Radiological examination, with "barium swallow," showed that the barium was held up to some extent in the oesophagus at the site of the aneurysm, while both the oesophagus and trachea were somewhat compressed and forced to the right. The Wassermann reaction of the blood serum was positive, of the cerebrospinal fluid negative, and the Lange curve of the cerebrospinal fluid was of normal type.

While the patient was in hospital (approximately two months) he had no further attacks of loss of consciousness. After dismissal he had occasional attacks for four months; then he abandoned treatment and contact with him was lost.

My thanks are due to Dr. W. R. Snodgrass, Visiting Physician, for his help.

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A Case of Kala-azar

The following case is of some interest by reason of the local rarity of kala-azar.

CASE REPORT

A Lascar seaman aged 40, from Calcutta, was admitted to Stobhill Hospital on January 14 as a case of post-malarial debility. He had been staying in a sailors' boarding-house for five weeks, and for the two weeks before admission had complained of "fever" accompanied by vague abdominal pain referred chiefly to the left upper quadrant of the abdomen. He had also had some diarrhoea.

He was a man of spare build and in rather a poor state of nutrition. There was no abnormal pigmentation of the skin. The tongue was moist and clean; pyorrhoea alveolaris was present. The spleen was slightly enlarged, both on palpation and on percussion, and somewhat tender. The abdomen otherwise appeared normal. A systematic examination of the cardiovascular, respiratory, and nervous systems revealed no features of importance. The blood picture showed: red cells, 4,190,000 per c.mm.; haemoglobin, 80 per cent.; white cells, 3,400 per c.mm.—neutrophils 70 per cent., eosinophils 3 per cent., lymphocytes 18 per cent., and monocytes 9 per cent. The urine contained no abnormal constituents. The blood serum gave no agglutination with *B. typhosus* H and *B. paratyphosus* A and B (H). Bacteriological examination of the stools showed only slight upset of the flora, with a few colonies of enterococci. The temperature chart showed an irregular pyrexia with a maximum of 103° F.

A few days after admission the patient coughed up a roundworm (*Ascaris lumbricoides*), and after the administration of santonin he passed three worms by the bowel. The fever failed to respond to quinine, and the diarrhoea continued. A further examination of the stool did not reveal amoebic cysts or helminthic ova, while culture now showed a heavy growth of enterococci. Frequent examination of films of the peripheral blood did not reveal the presence of malarial parasites. During the course of one such examination a neutrophil polymorphonuclear leucocyte was encountered containing leishmania bodies. The "aldehyde reaction" was negative.

The patient was given 1/2 grain of potassium antimony tartrate intravenously, and two days later a splenic puncture was performed by Mr. J. E. Paterson. Films made from the material so obtained failed to reveal the presence of parasites. Tubes of N.N.N. medium were inoculated, but after sixteen days' incubation no flagellate forms had developed. Following the first injection of antimony the temperature fell to normal and has since remained so. After a month's treatment the general condition greatly improved and the diarrhoea largely subsided. The spleen diminished in size, and there was no tenderness in this area.

COMMENTARY

As several steamship lines regularly sailing between Glasgow and Indian ports employ Lascar crews there is a not inconsiderable temporary native population in this city. It is therefore surprising that more cases of kala-azar are not met with in hospital practice. Speaking generally, in tropical medicine laboratory investigation plays a more important part in the establishment of an exact diagnosis than in the case of diseases of the temperate climates. It is suggested that when there is a doubt as to the cause of pyrexia in patients who have been exposed to infection by protozoa and other organisms associated especially with tropical and subtropical countries, a thorough laboratory investigation is a necessary adjunct to the clinical consideration of the patient.

In the present case the coexisting infestation by ascaris was considered to be of little or no significance, since throughout his whole life practically every native of the coolie class harbours helminths in the alimentary tract. It is obvious that the finding of leishmania bodies in the present case was purely accidental, and fortunate in that they were demonstrated on only one occasion and, indeed, in only one cell—a polymorphonuclear leucocyte—in the peripheral blood. In a personal communication Professor Edward Hindle informs me that whereas the parasite is commonly found in films of peripheral blood in cases of Indian kala-azar, in Chinese kala-azar they are rarely met with in such films.

The occurrence of the parasites in polymorphonuclear leucocytes is distinctly rare; it is explained by the mononucleated cell which originally contained them disintegrating and the leishmania bodies thus freed into the circulating blood being phagocytosed by a polymorphonuclear leucocyte. The present case is a notable example of the rapid improvement of the disease in response to antimony.

For permission to publish the case I am indebted to Dr. D. K. Adams, and I would express my thanks to Dr. F. E. Reynolds for his interest and help in the laboratory investigations which have been carried out.

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Reviews

BRITISH ENCYCLOPAEDIA OF MEDICINE

The British Encyclopaedia of Medical Practice, including Medicine, Surgery, Obstetrics, Gynaecology, and Other Special Subjects. Volume XI, Scarlet Fever to Testis, Undescended. Under the general editorship of Sir Humphry Rolleston, Bt., G.C.V.O., K.C.B., M.D. (Pp. 676; index pp. 54; 94 figures; 17 plates, some of which are coloured. 35s. net.) London: Butterworth and Co. 1939.

The eleventh volume of the new encyclopaedia contains important matter of interest not only to the general practitioner but to the specialist. Of the latter the most satisfactory is the full discussion of skin diseases by several dermatologists, covering occupational diseases, and skin complaints arising from insects and acarines, local infections, a special section on tuberculosis of the skin, and a well-illustrated summary of tumours of skin tissues—epithelial, glandular, and those derived from the vessels and nerves of the cutis. Under separate headings Dr. J. M. H. Macleod contributes an article on seborrhoea and Dr. Sydney Thomson on sclerodermia, while Colonel Harrison from his great experience puts into about one hundred pages a most satisfying description of the pathology, clinical appearances, and indications for treatment of syphilis, not only as it affects the skin but as a general infection. The long-established divisions into primary, secondary, and tertiary lesions appear to remain satisfactory ways of describing the clinical states, though in most other diseases the division is into acute and chronic stages, since there is overlapping.

Scarlet fever and small-pox are the representatives of the infectious diseases in this volume; septicaemia and bacteriaemia are dealt with by Professor Ryle and Dr. S. D. Elliott, tapeworm infestations of man by Dr. Manson-Bahr, tropical sprue by Dr. Hamilton Fairley, and scurvy by Dr. George Graham and Dr. C. F. Harris. Among other noteworthy articles are the sections on diseases of the spinal cord by Dr. F. M. R. Walshe and his collaborators, on diseases and deformities of the spine by Sir John Fraser and Mr. Mason Brown, and on diseases of the spleen by Professor McNee and Dr. John McMichael. Affections of the sympathetic and parasympathetic nervous system, their anatomy and physiology, and the clinical applications of present-day knowledge are adequately covered by Professor Learmonth; the indications for surgery and the results which may be expected are fairly set out. Readers will find a full and up-to-date description of what is known of the sex hormones; Professor E. C. Dodds has himself been a contributor to advances in the subject, and the bibliography gives numerous references from world sources. Practical application of these and other methods in dealing with sterility is made by Mr. Eardley Holland and Mr. Kenneth Walker, and the social aspects of sterilization are dealt with by Dr. Tredgold, Mr. Walker, and Dr. Beattie, while on the psychological side Dr. John Rickman contributes a useful article on sexual behaviour and sex abnormalities.

The editors have gone over-seas for a contributor on stomach tumours, and have found in Dr. Cleaver of Toronto an admirable one. He draws on his own experience and on that of the Toronto General Hospital to balance the often controversial statements appearing in textbooks generally; the results of Canadian research on the frequency and situation of ulcer-cancer of the stomach conform more nearly to those of our own workers than with the Mayo Clinic experience. Diseases of the testis and spermatic cord are capably dealt with by Mr. Barrington, the problems of squint by Mr. Williamson-Noble, and talipes by Mr. Denis Browne and Mr. Eric Lloyd. Dr. C. W. Buckley is broad-minded in his description and treatment of sciatica and allied complaints, and Dr. Cooke's article on silicosis sets out the clinical features and the differential diagnosis. Dr. Edwin Bramwell makes helpful suggestions to those who are confronted with matters of will-making and testamentary capacity in their patients, while the chief editor has tucked away his own considered thoughts in a short note on the problems of senescence and senility; it forms an excellent differential diagnosis scheme for dealing with elderly patients.

The satisfactory production and careful editing noted in previous volumes are well maintained, and as the series draws to a close the standard of excellence seems rather to increase.

HUMAN ACTIVITIES

Time-Budgets of Human Behaviour. By Pitirim A. Sorokin and Clarence Q. Berger. (Pp. 204. 10s. 6d. net.; 2.50 dollars.) London: Oxford University Press; Cambridge, Mass.; Harvard University Press. 1939.

The first sentence of the publishers' note on the jacket of Messrs. Sorokin and Berger's book runs as follows: "It is surprising that no one has hitherto made an inductive study of the ways in which human beings spend their time." Anyone who has served in public departments where official diaries had to be written up and returned to his superior weekly might object that such studies have often been made. It is true, however, that the diaries did not closely resemble the authors' data. When the nature of these data is considered the publishers' surprise is not likely to be shared by the reader. The subjects of the inquiry were asked to record on a schedule any activity that lasted at least five minutes of a twenty-four-hour day. The recording had to be done the same day and, "if possible, immediately after a given activity was ended and a new one started." Well over 100,000 schedules were distributed; about 10,000 were returned, and about half of these were discarded for various reasons, among others "obvious falsification." From the statistical appendix it appears that 3,472 schedules contributed by 140 women and thirty-six men are the basis of the elaborate tabulations provided in this book. One has indeed a good deal of statistical information respecting the way in which these young people (of the 176 only seventeen were over 40) spent their time. From a summarizing table it appears that physiological needs (sleeping, eating, being ill, taking exercise, washing, etc.) consumed 11 hours 12.7 minutes. Economic needs (earning one's living, including travelling to and from work), 7 hours 3 minutes. So these items absorbed eighteen and a quarter of the twenty-four hours. Pleasurable activities had 1 hour 30.6 minutes. Pleasurable activities do not include intellectual activities (1 hour 24.8 minutes), nor love and courting, which, however, occupy but 8.6 minutes of the day.

In addition to descriptive statistics the authors have tested their subjects' powers of forecasting. One hundred and six were asked to predict their activities on six future dates; their predictions were compared with the completed schedules. The results of this experiment are discussed in a separate chapter and crystallized into five italicized conclusions, of which the first is that: "Other conditions being equal, the further in the future the day predicted from the day of prediction, the greater the error is bound to be." The last is: "As a rule one can predict one's own behaviour more accurately than that of other persons, and that among these others

the behaviour of a well-known friend better than that of an unknown person." An examinee when asked a very simple question always suspects a trap. A reviewer confronted with propositions such as these, followed by the remark, "Such are some of the propositions suggested by the results of this study which concern prediction of the behaviour and activities of an individual or individuals," suspects irony. Perhaps the authors *are* following Butler and Swift, but we think they are in deadly earnest.

It is certain that the production of this book must have involved an immense amount of labour. We suppose that if similar studies were made of the activities of young people in other cities of America or other parts of the world their collation would be of interest. But it is arguable that time and statistical ingenuity might be better applied.

FACIAL PAIN

Studies on Pain Conduction in the Trigeminal Nerve. A Contribution to the Surgical Treatment of Facial Pain. By Olof Sjöqvist. (Pp. 139; 38 figures; 8 diagrams. Free to subscribers.) Helsingfors: Mercators Tryckeri. 1938.

This book, by Olof Sjöqvist of Professor Olivecrona's clinic in Stockholm, is not only, as the subtitle indicates, a contribution to the surgical treatment of facial pain but is perhaps the most important monograph which has yet appeared on the distribution of the fibres of the human fifth cranial nerve. This investigation has been carried out by making a fibre analysis of the trigeminal root and bulbo-spinal tract: the pain-conducting fibres in formalin-fixed paraffin preparations having been found to measure less than 3 μ in diameter are traceable among their accompanying fibres. Section of the bulbo-spinal trigeminal tract (trigeminal tractotomy, as it has been called) is here described in detail as an alternative to the retrogasserian and juxtapontine root sections of Frazier and Dandy respectively. Sjöqvist was the first to perform the bulbo-spinal operation, and records nine cases so treated since his earliest operation in May, 1937. The advantage of the operation, which since it involves opening the posterior cranial fossa is slightly more formidable than the temporal root section, is the preservation of tactile sensibility in the face while relieving the pain through the destruction of the pain tract. The steps of the operation are described.

The work is well illustrated throughout and includes also a number of diagrams, several tables, and a comprehensive bibliography. It represents an important landmark in our knowledge of facial pain and its treatment, and will be profitably studied by physiologists, neurologists, and neurological surgeons.

PHYSIOTHERAPY FOR THE PRACTITIONER

Physiotherapy in Medical Practice. By Hugh Morris, M.D., D.M.R.E. (Pp. 276; 102 figures. 12s. 6d. net.) London: Edward Arnold. 1939.

The preface to this book by Dr. Hugh Morris defines the scope of the work. It is not intended for the specialist, but for the practitioner who wishes to use physiotherapy to its best advantage in an ordinary general practice. The book is built up on the usual plan and first describes the physical principles underlying the therapeutic methods, and then proceeds to a more detailed description of the various forms of physiotherapy and their applications. The section on low-tension currents includes galvanism and faradism. The fact that manufacturers, for the sake of convenience, often produce apparatus from which both a galvanic current and a faradic one can be obtained, has led the author to describe these two currents in close proximity to each other, with a result that must be rather confusing to the reader who is not very familiar with either of them.

The author must be congratulated on including in his book short sections on two subjects that are frequently omitted from modern textbooks dealing with medical electricity. These are (1) diagnosis by means of electrical stimulation, and (2) treatment by static discharge. The latter is illustrated by an ingenious series of line diagrams. A chapter is devoted to diathermy and short-wave work, with a passing reference to surgical diathermy. Treatment with infra-red and ultra-violet light is also well described, and two chapters are devoted to a systematic description of various diseases, together with their appropriate physical treatment.

The whole book is profusely illustrated, usually in a practical manner, but illustrations such as Figures 47 and 48, showing wooden panels with large numbers of control stops and no explanation, are hardly likely to encourage the non-expert reader to embark on the practice of physiotherapy. An appendix is added in the form of the official Memorandum on Precautions against Shock from Electro-medical Apparatus, which will be valuable to anyone who is about to equip himself with the necessary apparatus. The glossary and index that follow are both useful and complete.

IMMUNIZATION AGAINST DIPHTHERIA

Die Diphtherieseuchenwelle in Deutschland und ihre Bekämpfung mittels der aktiven Schutzimpfung. By Professor Traugott Wohlfeil. Volume LII, No. 7. (Pp. 203; 18 figures; 112 tables. RM. 8.) Berlin: Richard Schoetz. 1939.

This work by Professor Traugott Wohlfeil on the epidemic wave of diphtheria in Germany, which forms part of a series of publications issued by the Public Health Service of the Reich, is, as its subtitle indicates, a report on the results of single injections of ditoxoid asid (alum-precipitated toxoid) and Al F.T. (aluminium hydroxide-adsorbed toxoid) for the years 1936 and 1937 and the duration of protection afforded by the older preparations (toxin-antitoxin mixture, toxoid-antitoxin floccules, and formol toxoid) given during the years 1934 and 1935. Professor Wohlfeil shows that on the whole the results obtained by the "one-shot method" corresponded to the two or three injections of the older preparations, which appeared to have produced an immunity of three years' duration. In most of the areas where the immunization was carried out school children contracted diphtheria more frequently than younger children, probably because the former were more exposed to massive infection. The seasonal influence of the autumn and winter months on an increased incidence of diphtheria was shown by an increase also of the disease among the inoculated, though this increase was much less pronounced in the inoculated than among the uninoculated. The incidence of the disease was the same among boys and girls. No bad effects were observed among more than a million children inoculated. The frequency of reactions in the form of transient redness at the site of injection or of small sterile abscesses in a few cases increased with the age of the child. There was no evidence of a negative phase following the injection of the new preparations. As a single injection did not always provide protection against an attack of diphtheria, two at least are advisable, and, indeed, are absolutely necessary in poorly immunized districts.

PERICARDIAL PUNCTURE

La Ponction du Péricarde: en particulier par Voie Epigastrique Sous-xiphoïdienne. By A. B. Marfan. (Pp. 75; 3 figures. 12 fr.) Paris: Masson et Cie. 1938.

Pericardial effusions which call for aspiration are relatively rare in primary cardiac disease, but it is usually required for the effusion of tuberculous pericarditis and always for infection by one of the pyogenic organisms. As the experience of most clinicians with the methods of aspiration of the pericardium will necessarily be small, the little book by Dr. Marfan on this subject will be useful. After a brief discussion of the difficulties in the diagnosis of pericardial effusion—none of the clinical symptoms or signs being pathognomonic, and the *x*-ray appearances not necessarily so—the author describes six different techniques which have been practised, and indicates their respective advantages and disadvantages. In the author's opinion the subxiphoid epigastric route is open to the fewest objections, is most likely to find fluid if present, and favourable for aspiration unless the fluid is encysted in the lateral or posterior parts of the sac. With this method the internal mammary artery, lung, and pleura are avoided, and puncture of the heart wall is least likely. Puncture of the peritoneum is said never to have been recorded, but this particular method is not advised when tympanites exists. Another contraindication is any considerable deformity of the lower end of the sternum. Haemopericardium due to rupture of the heart following cardiac infarction can be diagnosed during life, and if this produces tamponade of the heart, aspiration of the blood might be considered justifiable.

Marfan makes some suggestions for distinguishing a haemorrhagic effusion from blood obtained by accidental puncture of the heart wall. A good case is presented for the superiority in general of the subxiphoid route over other routes, and the technique is fully described.

Notes on Books

The second volume of Series 2 of the *New International Clinics* (J. B. Lippincott Co., 50s. the set of four volumes) is divided into three unequal parts, devoted respectively to original articles, clinics, and a review of recent progress in peroral endoscopy. The original articles, among other subjects, deal with pellagra, the functions of the pituitary gland, the prognosis of pulmonary tuberculosis, the roentgenographic image of bone lesions, neurological aspects of vitamin deficiencies, precancerous lesions of the rectum and sigmoid, menstrual dermatoses, malignancies of the male reproductive organs, and vaccine therapy in chronic and focal infections. The clinics contain brief accounts of agenesis of the lung, undifferentiated mediastinal tumour associated with glandular and miliary tuberculosis, latent gastric carcinoma, suprarenal concentrate in allergy, and a fatal case of meningococcal meningitis complicated by panophthalmia and parotitis.

The Vaginal Diaphragm: Its Fitting and Use in Contraceptive Technique, by LE MON CLARK, M.S., M.D., is published at 9s. by Henry Kimpton. In undertaking to teach the use of the Dutch cap Dr. Clark does not stop to discuss the necessity for contraception, and claims that this method is as efficacious as any used in medicine, since clinics report 95 per cent. of successes and private practice reaches 98 to 100 per cent. That family doctors should be ready to inquire about marital relationships as naturally and scientifically as about other physical incoordination is a useful point; and so is the emphasis on the need for sympathy with the emotional and aesthetic reactions of the patient and her husband. The importance of giving detailed instruction on the technique of the method used is wisely insisted upon, and valuable notes are made of the finer adaptations. Very clear diagrams, occupying about half of the 106 pages, are duplicated by anatomical drawings. Contraceptive cream or jelly alone is used, without distinction as to chemical content; and there is no reference to soluble pessaries, which English clinics generally prefer—evidently "volpar" has not yet reached the U.S.A. The monograph closes with a few wise hints about advice to brides. It succeeds in being a perfectly clear and satisfactory exposition of the best available method of contraception.

In their work on meningo-neurobrucellosis Professors HENRI ROGER of Marseilles and YVES POURSINES of Beirut show that brucellar infection may attack any part of the nervous system, but has a special predilection for the meninges. The description of the neurological localizations of brucellosis is preceded by a general account of the disease. An extensive bibliography is appended, in which the only reference to a British work is dated 1908. The book is published by Masson et Cie, Paris, price 45 francs.

In their work on hypertrophy of the prostate (Milan: Libreria Bocca, 45 lire) Professor NICOLA CARRARO and Dr. I. WUGMEISTER of Milan have given a clear, full, and up-to-date account of the subject accompanied by numerous illustrations, with the detailed history of thirty-four cases in patients aged from 53 to 85. A bibliography of over 300 references is appended in which the names of several British urologists appear, especially Freyer and Thomson-Walker.

Preparations and Appliances

ACETYL DERIVATIVE OF SULPHANILAMIDE

"Albucid" (Schering Ltd.) is an acetyl derivative of sulphanilamide—namely, *p*-aminobenzenesulphonacetamide. Sulphanilamide is partly detoxicated by acetylation in the human body, the *p*-amino group being acetylated to form a product which is therapeutically inactive. In albucid the amino group in the sulphonic acid side-chain is acetylated, and the compound has a high therapeutic activity. The special advantages claimed for albucid are that it is rapidly absorbed and excreted and that the drug is excreted in an unaltered form. These properties cause the drug to be of extremely low toxicity.

Messrs. Schering state that the drug has been used on an extensive scale in the treatment of gonorrhoea, and has proved to be both effective and of low toxicity. The initial dosage suggested is 9 tablets (4.5 grammes per diem).

COMPOUND VITAMIN PRODUCTS

"Polyvitamin Co." are compound vitamin products prepared by Messrs. Hewlett and Son. The fat-soluble vitamins A, D, and E are put up in capsules and in an oil. Another preparation, termed polyvitamin co. emulsion, contains vitamins A, B_1, C, and D. Previous workers have reported difficulties in obtaining stable preparations of this latter type on account of the tendency of vitamin C to interact with other vitamins.

SULPHONAMIDE-P OINTMENT

Sulphonamide-P ointment (Allen and Hanburys Ltd.) contains 5 per cent. of sulphanilamide incorporated in a readily absorbable base from which it will not crystallize. It is recommended for treatment of superficial infections of streptococcal origin. A 2-oz. tube costs 2s. 6d.

SUGAR, WHITE AND BROWN

BY

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I have recently sent out a questionary to nearly 4,000 men and women whose names are in the *Medical Register* and who are characterized as having some Cambridge degree. My object was to obtain information as to the conditions under which they prescribed glucose by the mouth, and also as to their opinion of the effect of a comparable dose of cane sugar under the same circumstances. Many hundreds have answered, and have supplied me with a great deal of interesting and important material. This will be circulated as soon as the spate of replies ceases and I have had time to analyse them thoroughly. In the meantime I have been much struck by the comments of quite a number as to the variety of table sugars they recommend. Some specify "cane" sugar as distinct from "beet" sugar; others desire information as to the nature of the substances present in "brown" sugars, which they imagine are of dietetic importance and which are removed when the sugar has been refined; others distrust what they term "synthetic" sugar. I trust that this short article on the nomenclature of sugar and on modern methods of refining table sugars may remove certain misconceptions.

Ordinary Sugar

The ordinary sugar of the table is sucrose, a compound with the formula $C_{12}H_{22}O_{11}$. By hydrolysis by very weak acids or by the action of the enzyme invertase it takes up a molecule of water and is split into equal parts of two sugars. One of these is glucose (or dextrose or grape sugar). The other is fructose (or laevulose or fruit sugar). The mixture of these two sugars is called "invert sugar," which is found in considerable amounts in jams made from cane sugar, which is largely hydrolysed by the acids in the fruits during boiling. It is also the chief constituent of golden syrup and of honey. In the United Kingdom sugar is obtained from sugar cane, which is imported, and from sugar beet, which is now largely produced at home.

White sugar is prepared in the refineries by dissolving in water either the imported sugar which has been extracted abroad from the sugar cane or the crude sugar from our home sugar-beet factories. The brown solution is filtered from large solid impurities and mixed with cream of lime, which is then precipitated by bubbling in carbon dioxide and heating. The solution containing the calcium carbonate precipitate is pumped through pressure filters, where the precipitate is removed, carrying with it various impurities entangled with and adsorbed on to it. The clear brown liquor is then passed through towers containing specially prepared bone charcoal. This removes the colouring matter and a considerable amount of other soluble non-sugar impurities which might interfere with subsequent crystallization.

The fine liquor obtained from the charcoal is almost water white. It is concentrated in steam-heated vacuum pans at low temperature. Sugar crystals are formed, and the conditions are so arranged that the crystal size is correct. The mixture of crystals and mother syrup ("massecuite") is discharged into tanks and stirred; it is then drawn into centrifugal machines and the mother syrup spun off through the perforated wall of the centrifugal basket. The wall of white sugar left is washed with a jet of boiling water, which is again spun off. The sugar is discharged to long cylindrical rotating dryers or "granulators." Thence it is carried to grading sieves and thence to the packing department. The mother liquors are worked up for further crops of crystals, which are dealt with in the same way. After a number of crops of sugar have been taken out the syrup becomes incapable of yielding a white sugar because successive boilings have formed some caramel, slight inversion may have taken place, and the original impurities in the fine liquor have become concentrated. This refined brown syrup is treated in one of two ways. Either it is partly inverted, passed over charcoal to improve the colour, and turned into "golden syrup"; or it is boiled again to give several crops of refined brown sugar, sold as "pieces" or "soft" sugar. The final syrup from which no more sugar can be economically crystallized is called "molasses."

The degree of purity of ordinary white table sugar is quite remarkable. The sucrose content is 99.95 per cent., the solid non-sucrose material (mostly salts of the alkali metals) being 0.03 per cent., the remainder being moisture.

Impurities in Sugar

Nowadays there is no difference in the product obtained after refining, no matter whether the crude material used was obtained from cane or from beet. It is the pure compound sucrose, which is generally known as cane sugar. There is no known chemical or physical test which can show whether pure sucrose has been obtained from the cane or from the beet. Cane sugar was the name given to the sugar (sucrose) extracted from the sugar cane—*Saccharum officinarum*—the plant from which sugar could be most easily extracted. The sugar cane has been a known source of sugar to mankind for at least 3,000 years. The popular name for sucrose is therefore cane sugar. Sucrose or cane sugar is present in all ripe fruits, in grasses (of which the cane is a gigantic example), and in many vegetables and trees. The sugar cane grows only in tropical or subtropical countries. Within quite recent times (about 150 years ago) it was found that one of the beetroots—*Beta vulgaris*—contained large quantities of easily extractable sucrose and would grow readily in temperate climates. This sugar was quite naturally called beet sugar, but it is sucrose all the same. Only the impurities differ in cane and beet sugars. The reason that beet sugar has got a bad name is that much beet sugar was in the past sold in an imperfectly refined state—as was and is much cane sugar. But whereas the impurities in impure cane sugar are pleasant to the taste, the impurities in impure beet sugar are disagreeable, and the relatively high percentage of potash salts in impure beet sugar reduced the sweetening power.

As to brown sugars generally, they contain sucrose plus a little invert sugar and water and a variety of impurities, which in the case of raw sugars may be definitely objectionable. They may consist of sulphites—a legacy from a method of attempting to decolorize the raw material, sand and clay, pieces of cane fibre, swarms of micro-organisms, and, worst of all, live sugar lice (*Carpoglyphus anonymus*), the cause of the "grocers' itch" of the last generation. Some of the imported brown cane sugars have been carefully prepared for direct consumption and are clean and wholesome, but many contain most or all of the impurities mentioned above. The specially prepared brown sugars, whether imported or made in a refinery, contain as principal non-sucrose ingredients invert sugar up to a maximum of about 7 per cent. and moisture up to about 4 per cent. It is important to state positively that brown sugars do not contain any vitamins or other valuable accessory food factors that are removed in the process of refining, which converts the crude material into a pure sterile compound of uniform composition. It is also quite clear that the old-fashioned demand for "real" cane sugar is met by the purchase of ordinary white table sugar.

The Medical Research Council has appointed Dr. Donald Hunter, physician to the London Hospital, and Mr. Harold E. Clay, national secretary of the Passenger Services Group, Transport and General Workers' Union, to be members of its Industrial Health Research Board, in succession to Professor J. A. Nixon and Mr. R. Coppock.

PHYSICAL TREATMENT OF RHEUMATIC DISEASE

The following report by Sir Leonard Hill, F.R.S., and Mr. H. J. Taylor, B.Sc., on "Certain Physical Methods in the Treatment of Rheumatic Disease," has been forwarded for publication by the Scientific Advisory Committee of the Empire Rheumatism Council:

REPORT ON APPARATUS

Proclaimed as of value in the physical treatment of rheumatic disease, there are several forms of apparatus offered to the public. Some of these are advertised to the medical profession only; others are advertised to the general community. It is obviously important that these apparatus should be submitted to accurate scientific investigation. Some may be altogether useless. Others, while being in a measure useful, may make claims to have effects which cannot be justified. Yet others are questionable from an economic point of view, since the effects which they produce can, by other means, be gained more simply and at a less cost. In regard to this last category, some consideration should perhaps fairly be given to what may be termed the psychotherapeutic factor. If some apparatus which will secure a good effect but at a higher cost than a simpler means can inspire in the patient a special degree of faith, there is no great harm done except to the purse of the purchaser, provided, of course, that no false claims are made, and that the extra charge on "faith healing" account is not unduly excessive. That consideration has been kept in mind during the investigation we have made of various claims.

The following facts are submitted to members of the medical profession in the hope that they will be of use when they are called upon to prescribe apparatus for rheumatic patients. On the general public it cannot be too strongly urged that it is dangerous to employ electrical or other apparatus except on medical advice and under proper supervision.

Ultra-violet Radiation

The active ultra-violet rays which produce sunburn in the skin are the shortest in the sun's spectrum, 0.3μ. Still shorter rays are produced by arc lamps, but these have little power of penetration, and such activity as they have on the skin is not different from that of the ultra-violet rays. The active ultra-violet rays scarcely penetrate beyond the epidermis, and they affect primarily the living epidermic cells, which they damage. The inflammatory reaction of sunburn ensues after a latent period owing to the presence of damaged cell products. Vitamin D is also produced by the action of these rays on ergosterol in the skin.

The iron-cored carbon arc in an arc lamp is efficient and is cheaper to run than the tungsten arc. The addition of a small quantity of titanium to the tungsten arc does not make any difference to the ultra-violet output of that arc. The contrary has been claimed. The price of mercury vapour lamps is reasonable, but the charge for stand and reflector usually increases the total cost out of all proportion to their value.

The artificial sources of light rays produce in truth mainly infra-red rays, less than 10 per cent. of the radiation being visible light. There is no evidence of the value of different coloured lights other than that of suggestion.

Infra-red Radiation and Other Sources of Heat

Water in a layer 1 cm. thick is opaque to radiation of longer wave length than 1.4μ. A piece of rat skin 0.41 mm. thick absorbs all radiation of longer wave length than 3μ and partially radiation between 2μ and 3μ. A dark source of heat, which gives all or nearly all its radiation in the form of wave lengths longer than 2μ, can therefore have only a surface heating effect; it cannot penetrate the skin. As in the case of a hot-water bath or a hot fomentation, heat is conducted in and carried away by the blood circulating in the derma. It is therefore unjustifiable to claim that dark sources emit rays of great penetrating power; and an ordinary domestic electric fire may be as good as a "dark heater" sold for treatment purposes at a far higher price. For example, as compared with an apparatus consisting of a heating coil and reflector costing, say, from eight to twelve guineas, an equally effective piece of apparatus in the shape of a bowl fire can be purchased for from 15s. to £1. Red rays and the short infra-red rays penetrate through the skin to the greatest depth.

Visible rays other than red on penetrating the epidermis are absorbed in the blood of the derma. Incandescent lamps are the best sources of the more penetrating rays. When a glow lamp is placed in the mouth about 10 per cent. of the rays penetrate the cheek, 5 mm. thick, of a white man; no rays penetrate the cheek of a negro.

The modern gas fire with bright radiants is one source of the more penetrating rays. These rays excite flushing and transudation and are more comfortable than rays which heat the surface only. It is claimed that the penetrating rays heat tissues under the epidermis more than they heat the surface.

The flushing, increased flow of lymph, and softening of tissue produced by heat, their analgesic effect and their heightening of tissue metabolism, are of great value, and can be obtained by simple inexpensive means such as baths, fomentations, and radiant heaters. For deep heating the ultra-high-frequency current can be used. This has no specific effect other than heat. Low energy high-frequency apparatus does not heat; therefore it has no effect other than that due to suggestion, although claims are made to the contrary by salesmen of various apparatus.

Mild Radio-activity

There is no trustworthy scientific evidence of any biological effect of weak radium doses. It is claimed that weak radio-active pads now on the market have a beneficial effect on rheumatism. If in such a pad 0.1 mg. of radium is put, the cost at the current price of pure radium bromide would be 8s. If a raw mineral ore containing radium is used the cost would only be a fraction of this. If such a pad is sold for ten guineas the profit is very great.

An electrically heated pad is useful for treating painful parts, and can be bought for about 30s. If an electrically heated "radio-active" pad is sold for twenty guineas the profit is exorbitant. No improvement of the clinical conditions other than subjective has been found from treating cases of chronic arthritis with weak doses of radon.

The Constant Current

The switching on and off of a direct current may cause nerve stimulation at some depth. One cannot therefore say that no effect is procured below the skin. The effect due to electrolysis, however, is confined to surface tissue, since the chemical changes take place at the electrodes. The skin flushes owing to the setting free of acid at the positive, and alkali at the negative, poles. The action can be intensified by dipping, before application, the positive (lint-covered) pole in dilute acid, and the negative one in dilute alkali. The current is used also for iontophoresis, therapeutically active ions being introduced into the tissues by its passage.

Mitogenic Radiation

Gurwitsch first claimed that growing rootlets, dividing yeast cells, etc., emitted radiation in the ultra-violet region of the spectrum. Over 600 papers have been published on the subject. The American Bureau of Standards, after carrying out much research and investigating every claim, have come to the conclusion that such mitogenic rays do not exist.

LEONARD HILL.
H. J. TAYLOR.

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AETIOLOGY OF RHEUMATIC FEVER

There are few diseases having the semblance of an acute infection the cause of which is still unknown. There is certainly only one such disease in which several different microbic agents have been demonstrated, without its yet being possible to assess their significance. Such is the position of rheumatic fever at the moment. That haemolytic streptococci are closely concerned there can be no doubt; a mass of unequivocal evidence, clinical and serological, testifies to this. The evidence is indeed far more voluminous and complete than that relating to any other micro-organism in connexion with the disease; no explanation can leave it out of account, and indeed it would suffice in itself if we knew why the rheumatic subject should respond to streptococcal infection in this peculiar way. But haemolytic streptococci are not the only claimants in the field; there are now two others. It is four years since Schlesinger, Signy, Amies, and Barnard announced observations pointing to the presence of a virus in the lesions of rheumatic fever. By the high-speed centrifugation of rheumatic exudate they obtained particles with the properties of elementary bodies, and these were specifically agglutinated by the serum of active cases of the disease. The further progress of study on these lines has produced new results, only of a negative character; repeated attempts to infect animals with suspensions of these bodies have failed. The latest contribution is that of G. Hardy Eagles and W. H. Bradley,[1] who have performed agglutination tests of the same kind with different results. The agglutinable suspensions were obtained by centrifuging pericardial and pleural exudates from cases of rheumatic fever; of these it is said that "the supply was never equal to the demand," and in view of all that is going on, these fluids will evidently be among the most sought after of all pathological materials for some time to come. The sera used were taken from three classes of patient: cases of juvenile rheumatism with carditis or chorea, cases of rheumatoid arthritis mainly in adults but including some examples of Still's disease, and, thirdly, patients with definitely non-rheumatic joint conditions such as gonococcal and pneumococcal arthritis and gout. The number of positive results was approximately the same in all three of these groups, an observation in direct conflict with the original findings, and only to be interpreted as depriving them of most of their significance. Nor was there any apparent relation in rheumatic cases between a positive agglutination test and either the clinical activity of the disease, the red cell sedimentation rate, or the anti-streptolysin titre.

To accept these findings is to abandon any idea that the particles found in rheumatic exudates are the causative virus; they would appear rather to be non-specific and non-microbic products of inflammation, and speculation on their nature and on the factors determining their agglutination by the serum of other patients is not likely to bring anyone much nearer to the main object of this study. It requires some stretch of the imagination to connect the agglutination of these particles with the precipitin reaction recently described by Coburn and Pauli[2]; there is a good deal of difference between the agglutination of pre-existing particles and the formation of new ones. Whatever view may be taken of the significance of this work, it can leave the virus hypothesis no worse off than it was in 1935, before such work began. On the other hand, this hypothesis would be seriously shaken if another occult and elusive micro-organism were recovered from rheumatic lesions, and this is what has now happened. Homer F. Swift and T. McPherson Brown,[3] who are responsible for this entirely new finding, began their work by inoculating the chorio-allantoic membranes of hens' eggs with rheumatic exudates, whereby they produced characteristic nodular lesions which could be transmitted in series from egg to egg. Material from these lesions, and rheumatic exudates themselves, when administered intranasally to anaesthetized mice, caused a transmissible non-bacterial pneumonia. Infected material either from eggs or from mouse lungs yielded in culture what it is now customary for want of any generic name to refer to as a "pleuropneumonia-like organism." At this stage it was still arguable that this organism was derived from some intermediate source such as the mouse itself; attempts were therefore made to cultivate the organism directly from rheumatic exudates. These succeeded, cultures being obtained from a joint fluid and from an excised erythema nodosum nodule. Cultures of this derivation also produced the same type of pneumonia in mice and various rather equivocal effects in rabbits.

It should perhaps be added that pleuropneumonia is a disease of cattle caused by an exceedingly pleomorphic micro-organism, the small forms of which will traverse bacterial filters. It is clearly distinguished from viruses not only by its mor-

[1] *Quart. J. Med.*, 1939, **8**, 173.

[2] *J. exp. Med.*, 1939, **69**, 143.
[3] *Science*, 1939, **89**, 271.

phology, which includes globoid and filamentous forms, but by its capacity for growth in artificial media; the colonies formed even under optimum conditions are small and easily overlooked. Similar micro-organisms have recently been reported from a variety of pathological sources other than pleuropneumonia; they appear to be responsible for what is called "rolling disease" in mice and for an arthritis which occurs in rats. Organisms with such characters could easily have been missed even in the multitude of bacteriological examinations of rheumatic lesions carried out in many past years, a circumstance which makes this new idea even more engaging and plausible. On the other hand, we need scarcely point out that very much remains to be done before the connexion between rheumatism and a micro-organism of this kind can be considered as established, and even if this point should be reached there will probably be a good deal in connexion with the disease which has still to be explained.

FIFTEEN TO EIGHTEEN

One of the widest and most urgent national problems to-day is care and provision for the adolescent. It is now thirteen years since the report of the Consultative Committee to the Board of Education entitled *The Education of the Adolescent* (known generally as the Hadow Report) was published; but this was concerned almost wholly with the reorganization of the public elementary and secondary schools in certain respects and with the raising of the compulsory school age from fourteen to fifteen years. It is only in September of the present year that the legal enactment of this later age comes into actual operation, and, even so, the exceptions permitted to be made are so many that the extent to which it will be effective is doubtful. Legally and officially youths and girls from the school-leaving age up to eighteen years of age are known as "young persons," and they are protected in certain ways by some few Acts of Parliament. Communal responsibility for their social care, and the need for public provision for their further education and for their physical recreation and leisure, are only just beginning to be recognized. Questions arising in this connexion are very numerous and very important, and may yet become more so, because, if the establishment of the Militia is to be more than temporary, it may well be that provision should be made right up to the normal age for enlistment—that is, up to twenty years.

The King George's Jubilee Trust was formed some three years ago "to advance the physical, mental, and spiritual welfare of the younger generation." The council of the Trust has large funds and great responsibilities. It has embarked on a careful study of the facts of the situation and invited Dr. A. E. Morgan, formerly principal of Hull University College and recently vice-chancellor of McGill University, to investigate the position and make a general report upon it. The Trust has now published Dr. Morgan's report through the Oxford University Press, with the title *The Needs of Youth*.[1] This is a book the value and importance of which can scarcely be exaggerated. Here we have a full and very careful survey of the field. In its presentation of the facts it is comprehensive and ordered. In its discussion of problems it is balanced and shows no evidence of bias. In its statement of conclusions and suggestions it is sensible and modest yet outspoken. It is an intensive study, reliable, authoritative, thought-provoking.

To enumerate even the most important of the problems with which Dr. Morgan deals is impossible in a short notice. He begins with those of whole-time or part-time education, and considers the relative advantages of the day continuation school, the technical school, and evening classes, and, later, junior instructional centres for the unemployed. He goes on to questions relating to the entrance upon employment, "blind-alley" occupations, vocational guidance, and juvenile transference in relation to unemployment. He then proceeds to consider the conditions of juvenile employment and training in actual work, and gives interesting examples of the way in which these have been met by such firms as the Gas Light and Coke Company, Cadbury Brothers Ltd., and Sainsburys Ltd. Dr. Morgan explains the effects of mechanization of the factory, and the opportunities for leisure which this tends to afford. The ways in which these opportunities are lost or taken advantage of are passed in review, and the various organizations, at present mainly voluntary, which attempt to provide for them in the case of both boys and girls are described. There is a chapter on "Delinquency and Reform," and another on "Leadership," both of much importance. In the chapter on "Conditions of Life and Work" due consideration is given to such matters as medical care, nutrition, personal hygiene, and industrial accidents. Equally impossible it is to indicate adequately the extent and nature of the author's findings as to the social conditions or circumstances which have a detrimental influence on these young persons or as to the reforms or remedies he suggests. It may be pointed out, however, that among the major evils he places gambling and the

[1] *The Needs of Youth. A Report made to King George's Jubilee Trust Fund.* By A. E. Morgan, M.A., LL.D. Oxford University Press. 10s.

nature of the great majority of cinema films. The latter is an example of the commercialization of leisure: "instead of having amusement as its essential aim the new recreation exists primarily to make profit for the purveyor. The inevitable tendency is to play down to the public taste rather than to attempt to elevate it." What matters most is that the chief pastime of the nation is "a dope and not a spur." As to gambling, betting has increased rapidly and recently to immense proportions. "The national betting bill is to-day about £500,000,000. . . . It is estimated that £50,000,000 is profit to promoters." The evils of this waste in unproductive expenditure and the ubiquitous temptations to the young are obvious. "From being a nation in which there were gamblers we have become a nation of gamblers."

With regard to remedies or means of betterment, Dr. Morgan would seem to place most reliance upon day continuation schools under proper conditions, with compulsory attendance up to eighteen years of age as the rule, and upon the wide provision of community centres and juvenile centres, mainly under voluntary management, but under the auspices of, and largely supported financially by, local authorities and education committees. As is usual in this country, such organizations and centres have been almost entirely provided by voluntary activities. The extent of the requirements and the large financial commitments involved, however, are now seen to be beyond the capacity of purely voluntary effort, and it is a gratifying fact that, under recent legislation, education authorities in all the more important areas are now showing a great interest in this movement and are taking active steps to promote and help schemes for the effective establishment and conduct of properly equipped centres. Dr. Morgan's report should provide further stimulus to this activity, and his discussion of the organization, purpose, and governance of juvenile centres should prove of great value to all who are interested in them.

TREATMENT OF RADIATION INJURIES

Increasing use of radiotherapy might have been expected to result in a greater incidence of the type of injury commonly called a "burn," especially as the average dose of radiation administered in cases of cancer is much higher than even a few years ago. The indolent ulcer typical of the late effects of irradiation is in no sense a "burn," but a necrosis of partially or completely devitalized tissues. Such devitalization is in fact much more likely to follow repeated small doses of radiation than a single intensive course such as is usually given for malignant disease, and for this reason a late radiation necrosis is seldom seen in spite of the increasing number of cancer cases treated. Most of these injuries in this country ultimately reach the reparative surgeon, and nine out of ten are found to have had repeated doses of radiation over many years for some benign condition, such as a goitre or a tuberculous sinus. Late radiation ulcers appear to be more common on the Continent than here, probably because radiotherapy for benign lesions is more extensively practised. Uhlmann[1] has personally treated seventy cases; of the fourteen illustrative case histories cited in the paper, in only two had the ulcer followed irradiation for malignant disease. Uhlmann reviews the many methods that have been employed in the attempts to heal the injury, and points out that no success could be expected from those based on the treatment of burns, for in a radiation injury the devitalized tissues lack any regenerative power. Attempts to stimulate the indolent tissues by beta-radiation have not infrequently resulted in the production of an epithelioma, so that it is a little surprising to find that Uhlmann claims to have obtained healing in all but two of his seventy cases by the use of a radon ointment. It is true that the radiation from a radon ointment will consist mainly of alpha rays, while the concentration of radon recommended by Uhlmann is very small—50 to 100 e.s.u. per gramme of petroleum jelly; the ointment is applied for a period of eight hours at weekly intervals. The method is empirical and no explanation is given of why it is successful, but as injured tissues are still present even after healing of the ulcer plastic surgery would seem to be the method of choice. The proper treatment of radiation injuries is to avoid them—by ensuring that those who use radiations understand their nature, and that they have enough judgment based on general medicine to check too great an enthusiasm for their specialty.

MASSIVE DOSES OF ARSENIC FOR SYPHILIS

Ever since Ehrlich first spoke of a "therapia magna sterilisans" syphilologists have been hoping to effect an immediate and permanent cure of syphilis with a single and perhaps massive dose of salvarsan. From time to time cases have been reported in which a single injection has effected complete cure, but the numerous relapses in the early days of salvarsan, when only a very few injections were given, have led the medical profession to increase the number of injections more and more, and to give some form of heavy metal in addition, in order to attain the maximum percentage of cures in early cases. Moreover, the serious and sometimes fatal reactions after large doses of salvarsan have led to the drug being given in moderate doses, over long periods, and at intervals usually of about a week. Nevertheless some workers have employed short intensive treatment, but with results hitherto little if any better than those obtained by generally approved methods. In 1935 Chargin, Leifer, and Hyman[2] gave an account of their treatment of twenty-five cases of

[1] *Amer. J. Roentgenol.*, 1939, **41**, 80
[2] *J. Amer. med. Ass.*, 1935, **104**, 878.

primary and early secondary syphilis with a short intensive course of neoarsphenamine (an average of 4 grammes in five days) by the intravenous drip method, and now[3] report their five-years observations. Five of the twenty-five patients disappeared before their serum reactions had become negative; in five more the reactions became negative but the patients could not be followed for more than twelve months. Of the remaining fifteen, repeated blood tests were negative in eleven, cerebrospinal fluid examinations were negative in thirteen, and teleoradiographs were normal in nine. Two patients are stated to have been reinfected, though the evidence in the case of one is not very conclusive. Immediate reactions were mild, consisting of some rise of temperature, moderate Herxheimer effects, and erythemata. No severe skin reactions or jaundice were noted and no serious late effects. This intensive treatment involves hospitalization of the patient for about five days, during which four 1-gramme doses of neoarsphenamine, each combined with 1,500 c.cm. of dextrose, are given, each injection taking about fifteen hours. An experience of twenty-five cases is not enough to warrant the casting aside of methods of treatment which have been evolved in the course of many years as a result of an experience of thousands of cases, but if 4 or 5 grammes of neoarsphenamine can always achieve in five days as much as or more than thirty to forty injections of the same drug plus thirty to forty of heavy metal given over a period of a year or more, the treatment of early syphilis will be revolutionized. It is rather surprising that, though others have employed massive dosage in the treatment of syphilis, and though this drip method was published several years ago, it does not seem to have been taken up to any great extent. Syphilologists will do well to maintain a critical attitude, but if other workers confirm the claims made for the "drip" method it certainly seems worthy of an extended trial.

VITAMIN A_2

Morton and his co-workers[4 5 6] have found a substance in fresh-water fish which is akin to, but not identical with, vitamin A. They designate it vitamin A_2. It differs from vitamin A in its maximum absorption at 350 mμ (vitamin A has maximum absorption at 328 mμ), and in the colour test with antimony trichloride it absorbs at 693 mμ (vitamin A absorbs at 617 mμ). Vitamin A_2 probably functions in fresh-water fish in the same way as vitamin A functions in sea fish. It has been found only in those mammals or birds which have been known to feed on fresh-water fish. As is well known, α- and β-carotenes can act as vitamin A in the mammal, though it is not certain that they are converted into vitamin A before acting. Morton and his co-workers have just shown that carotene can be converted into vitamin A_2 by perch kept under laboratory conditions and fed each day on blow-fly larvae dipped in finely powdered leaf carotene, a mixture of α- and β-carotenes but little or no "xanthophyll." Control fish kept in another tank were fed on untreated blow-fly larvae. The stores of vitamins A and A_2 increased considerably, and it was therefore concluded that carotene acts as provitamin for the formation *in vivo* of both vitamins. The constitution of vitamin A_2 cannot be very different from that of vitamin A. A certain amount of work has been carried out by these workers on the distribution of vitamin A and vitamin A_2 in the different parts of the body of sturgeon, lampern, and dogfish, and in the herring gull, skua gull, and gannet. In one large sturgeon the liver was found to contain about 30 grammes of vitamin A esters and 7 grammes of vitamin A_2 esters. The intestines contained about 6 grammes and 0.5 gramme of vitamin A and vitamin A_2 esters respectively. Thus the ratio A/A_2 was much higher in the intestines than in the liver. In lamperns only small quantities of these substances occur, vitamin A predominating over vitamin A_2. The dogfish has very little of either. Sea birds have much more vitamin A in their intestines than such animals as the rabbit. The gannet contains large amounts in its lungs. The authors conclude that vitamins A and A_2 probably do not replace one another with equal readiness in all functions. The concentration of large amounts of fat and vitamin A in the mucosa, and particularly in the tunica propria of the intestines, of many species of fish seems to be due to the presence of a dense continuous layer of connective tissue which prevents fat transport as droplets. There is no lymphatic system in fish, and it is suggested that vitamin A esters, in combination with protein, may help in the dispersion of these droplets and in the removal of fat from the tunica propria. Oil from the halibut's intestine[7] is a mixture of free fatty acids, free cholesterol, and free vitamin A, together with their esters in varying amounts. It also contains a water-soluble material with selective absorption at 261 mμ whose function is still under investigation. Growth tests on rats[8] suggest that vitamin A_2 has some biological activity for the rat, but there is no suggestion at present that it is necessary for the human being.

HEART DISEASE AND CLIMATE

Often enough the appearance of cardiac symptoms in an individual cannot be explained except on the basis of a progressive disease process in the heart muscle or its arteries. The patient is frequently eager to find something tangible to blame, such as diet, exertion, worry, and in some cases an internal or external event adds to the work of the heart or reduces its capacity. Acute infections, injuries, operations, and variations in climate can all act in this way. Subjects with effort angina know how readily their pain is brought on by walking against a cold wind. That there is something to be said for those who like to blame the weather for their troubles is suggested by the work of W. B. Bean and C. A. Mills,[9] who have studied the relation

[3] *Amer. J. med. Sci.*, 1939, **197**, 480.
[4] *Biochem. J.*, 1939, **33**, 318.
[5] Ibid., 325.
[6] Ibid., 330.
[7] *Biochem. J.*, 1939, **33**, 338.
[8] Ibid., 1938, **32**, 405.
[9] *Amer. Heart J.*, 1938, 701.

between the weather and coronary occlusion. After excluding all cases in which acute infections, injuries, or operations had occurred, they found the incidence of this lesion to be definitely higher in the winter months. In warmer and less stormy years the incidence was unusually low, as it also was for heart failure of arteriosclerotic or rheumatic origin. In syphilitic heart disease, on the other hand, failure showed no seasonal variation. F. A. Willius[10] points out that the aggravation of effort angina in cold weather may be related to the effect of inhaled cold air on the pulmonary vessels in addition to the constriction of the vessels of the skin. He has noted the favourable effect in such conditions of a scarf worn over the nose and mouth. I. M. Moriyama and L. P. Herrington[11] investigated the relation of cardiovascular and renal disease to climate and to social and economic factors in five of the United States. They found climate had a real effect on the incidence of circulatory disease, but it was not so important as the social and economic factors. Cold and stable climates showed the highest rates. The least favourable climate for angina pectoris was one that was stable but cold and damp. Although from these reports it appears that heart disease is more prevalent in winter than in summer, it is known that a sudden increase in the environmental temperature throws a strain on the heart. H. C. Bazett[12] has described the circulatory changes during a sudden rise in temperature—for example, in artificial fever therapy, or when a limb is immersed in a hot bath—and shows that the increased volume of blood in the superficial tissues leads to internal vasoconstriction and to an increase in cardiac output; the former may be so extreme as to raise the blood pressure. The constriction of the visceral vessels may be harmful. When the rise in temperature is more gradual the circulation can adjust itself to the change, chiefly by increasing the circulating blood volume, and the risks of pyrexial treatment might be reduced by preliminary exposures to moderate heat. Theoretically, a heat wave would have an adverse effect on patients with heart disease, and Bazett has noted exacerbation of symptoms in hypertensive subjects in the early summer, when temperature rises abruptly, as well as in the early autumn, when it falls.

NATURALISTIC MALARIA CONTROL[13]

The natural relation between living organisms and their surroundings is a most complex but delicate balance, and the "naturalistic" control of malaria is based upon extension or intensification of natural processes which disturb this balance so as to limit the reproduction of mosquitos or their contact with man. It is not expected that such measures will replace draining, oiling, spraying, screening, or insecticides, but they open up supplementary fields which hitherto have been virtually ignored by engineers and health officers and unexplored by all except a handful of biologists. The methods available show great variety and ingenuity, and in many cases several may be employed in a combined attack. Deliberate pollution of water by industrial wastes or by throwing in herbage to decay may have a remarkable effect in inhibiting anopheline breeding. Alterations in the salinity of lagoons or swamps brought about by tidal gates may be of the greatest value: thus the Zendrini Gates at Viareggio turned a brackish-water lagoon into a fresh-water marsh and kept the surrounding territory free from malaria for two hundred years. In some instances the free sweep of tides and the scouring of swamps may be the important matter. Other measures include the deviation or control of streams to produce filling by silting, or the destruction of larvae by vigorous sluicing, flooding, or intermittent drying. Shading or exposure to sunlight are well-known ways of controlling appropriate species of mosquitos, as is the introduction of natural enemies of larvae, such as fish. Even constant rippling of the surface of pools by the discharge of surplus water from bamboo conduits some feet above the surface has sufficed to inhibit mosquito breeding. Methods for the direct control of adult mosquitos seem less successful. Any method must be based upon precise determination of the actual vector concerned, since anopheline species are different bionomically as well as structurally, and even closely allied forms are never alike in their inherited instincts or behaviour. A careful study of the habits of breeding, feeding, resting, mating, wintering, and so forth may reveal some point of attack analogous to those which in Nature so often restrict the insects' multiplication and activities. It must be insisted that such a study must be carried out locally and may have little validity in another region, even where the vector is reported to be the same species. This preliminary work is essential and must be accurate if it is to provide a sound basis for naturalistic control. By a careful consideration of all the possible factors the zealous malariologist will often be able to devise measures which are effective yet relatively inexpensive, and by utilizing village labour and cheap or free material available locally make it possible for the work to be subsequently carried on by the inhabitants of the district.

[10] *Proc. Mayo Clin.*, 1938, **13**, 703.
[11] *Amer. J. Hyg.*, 1938, **28**, 423.
[12] *J. Amer. med. Ass.*, 1938, **111**, 1841.
[13] *Bull. Hlth. Org. L.o.N.*, 1938, **7**, 1016.

By an Order of the Committee of Privy Council Professors A. J. Clark and T. R. Elliott are appointed members of the Medical Research Council in succession to Professors H. S. Raper and J. A. Ryle, who retire in rotation on September 30.

We are informed by Mr. W. Rowley Bristow that a film has been prepared in the Orthopaedic Department of St. Thomas's Hospital showing the methods of manipulation used by Sir Herbert Barker as originally demonstrated by him to the members of the British Orthopaedic Association in July, 1936. The film shows the exact technique and details of the manipulations, and is to be offered to the British Orthopaedic Association. It is not intended that it shall be shown to the public.

WAR WOUNDS AND AIR RAID CASUALTIES

The following is one of a series of lectures on the Treatment of War Wounds and Air Raid Casualties recently delivered at the British Postgraduate Medical School

WAR WOUNDS OF THE HEAD—I

BY

GEOFFREY JEFFERSON, M.S., F.R.C.S.

War-time surgery is largely the management of potentially or actually infected wounds and of open bone injuries, a type of work which in peace time is delegated so much to the more junior hospital officers that the more senior are apt to bring minds to the problems unfreshened by recent experience. Wounds of special organs or of special regions have their different importances, not only in relation to treatment but as regards the ultimate fate of the patient and his later usefulness as a citizen. On the whole, less was written about head wounds during and after the last war than of any other. Few people understood them or had had any experience of the first principles of neurosurgery. In a few centres the head wounds came, later in the war, to be segregated, and as the result a standardized treatment was adopted that resulted in an improvement in results, which no doubt could in future be carried further.

Team-work and Instrumentation

Wounds of the head do not mix well with other casualties in the rota for operation. The need for pre-operative study and the rather more fastidious technique necessary in their treatment do not harmonize well with the tempo of that for miscellaneous injuries. The necessarily slower and gentler operations may cause administrative difficulties which can only be overcome by segregating the cases so far as possible. For if they have to take their turn on the same table with injuries of other regions they come either to be operated upon by those without the necessary knowledge and ability, or they hold back other serious but more expeditiously dealt with injuries to their disadvantage. Further, the ideal of speed may become established to such an extent that even the necessary pre-operative *x*-ray study of each case may be omitted (a serious blunder). This matter is important for two reasons at least: first, because the mortality of head wounds is distinctly lower in the hands of those who understand them; and, secondly, because the residual disabilities are less. It is only too easy to increase damage to the nervous system by injudicious operating, and so to leave to the community's charge a permanently crippled individual. There will be enough of those, whatever happens and whatever their injury; we must plan, so far as possible, to keep their numbers low.

Not only is the arrangement of teams necessary, but they cannot proceed properly without the correct instruments. The general nature of these is standardized, and they are easily obtainable. Without them proper work cannot be done: the old hand-trephine and bone-nibbling forceps of ancient pattern are not conducive to good work.

Neural Damage and Neurological Signs

A man may die of a head wound from different causes or from a combination of several factors—sometimes from haemorrhage from the great vessels of the brain and dura, from injury to vital centres in the brain-stem and more often in the hypothalamus, from consecutive cerebral oedema; or, if he survives these things or if the site and nature of his wound exclude these others, from septic encephalitis and meningitis. A wound of the head usually leads to some disturbance of function, but circumscribed wounds do not cause unconsciousness. Indeed, the greater number of the patients have suffered only a temporary loss of consciousness, and examples of dural penetration are to be found amongst the walking wounded. On the other hand, a comatose patient may or may not be going to die, as may one with lighter damage perhaps more heavily infected. The clinical disability at the time depends on the purely chance factor of the site of the injury, its depth and direction. There will follow the physiological deficit proper to the cerebral area injured, and it is essential that the signs should be noted and correlated with the position of the wound of entrance and with the *x*-ray evidence of the direction of penetration. In this way the surgeon comes to have a clear picture of what he intends to do, and in this way, too, he can follow the course of the case intelligently afterwards. An increase in the signs a few days later may indicate the formation of an abscess, but if the surgeon has no record of the early state he will have no means of interpreting the new features.

No greater mistake can be made than to think of a gunshot wound of the head as a pure exercise in operative technique without reference to neurological signs. Unless this creed is fully and conscientiously accepted we may see patients come to the operating table without any previous study. And if that happens, how is the surgeon to know whether a superficial injury of the bone, a groove in its surface, or a fissured fracture requires trepanation? More important still, how is he to know whether the dura should be opened? A decision on this point is never very easy, but it cannot be made on local appearances alone. It is the presence or absence of signs of intracranial disturbance which is the deciding factor. The use of the protective helmet allowed soldiers to suffer blows upon the head which would otherwise have killed them outright. But, although life is saved, the violence of the blow not uncommonly caused a contusion of the cortex which led to weakness of an arm or of a leg or to a hemianopia even beneath an unbroken skull. The occurrence of Jacksonian epilepsy or of an aphasia after a proved pure scalp wound tells a story in this connexion which all may read. I published a series of cases which gave evidence of outspoken neurological signs after scalp wounds without damage to the skull, as proved both by *x* rays and by exploration. The fact that these cases existed in fair numbers sufficiently underlines the point I wish to make.

An important aspect of this question is that of consciousness and unconsciousness. If a casualty is unconscious the omens are bad. The reason is at once apparent if we compare the effects of the closed fractures of the skull of civilian practice with localized open injuries. In the former the whole brain has been submitted to violence, so that loss of consciousness for a greater or lesser length of time is the rule. In local injuries no such generalized effect is to be expected, and most soldiers with head wounds spoke of having been at most temporarily stunned, even when the dura had been

penetrated and even when a shell fragment was embedded. If, therefore, a patient with such an injury is unconscious the indication is that severe damage has been inflicted on the brain by the missile. In the casualties which survive to reach the surgeon the wounds are not always very deep, and the patient, though he may be confused, is often conscious. The wounds can be graded (Cushing) according to severity thus:

1. Scalp wounds.
2. Wounds with superficial damage to the skull.
3. Wounds with severer injury to the bone but without dural penetration.
4. Wounds with injury to scalp and bone, with the dura torn.
5. The same as before, but with bone fragments in-driven and sometimes a retained missile.
6. As before, but with the fragments reaching the lateral ventricles.
7. Perforating wounds, through and through the head.
8. Penetrating wounds or perforating wounds opening the mastoid or paranasal sinus (cranio-facial or cranio-mastoid injuries).

Positive neurological signs may be present with even the simplest-looking injuries. I repeat this point, however obvious it sounds in relation to some of these injuries, because it is so important. Neural disabilities, when present, put a certain onus on the surgeon, who must do his best not to aggravate them by his treatment of the wound, and on the nursing staff in after-care. A hemiplegia, for example, needs special nursing attention; even more so does an unconscious and restless patient. An aphasia complicates the picture by making it difficult for the patient either to communicate his symptoms or to declare his wants. But all these original injuries will be worsened and be made permanent if infection develops.

Contamination and Infection

In general, operations are performed on wounds of the head because the patient can only in that way be relieved of such symptoms as he has, and because we know by experience that if no operation is done he runs a serious risk of dying from sepsis, whatever his original signs may have been, little or great. It comes to be the case, therefore, that the operation is planned both to relieve him neurologically and to prevent infection. The two desiderata are interlocked, for infection will increase his disablement even if he survives. The experiences of the last war made it clear that whereas various antiseptics had their uses, none was so potent that it could compete with the earliest possible and most complete excision of the wound as the ideal treatment. In head wounds this must remain a counsel of perfection, for a complete excision of contused and contaminated scalp and skull cannot be extended to the dura and brain. This is not so grave an obstacle to the patient's recovery as might be expected, for with skilful treatment of the more superficial areas the brain has an opportunity to deal with the injury; its powers of overcoming infection are considerable once devitalized tissue and foreign bodies have been removed. The worst cases will be those with a deep wound with a projectile lodged at a depth, whence bacterial spread may reach the lateral ventricle. It can be accepted as a fact that all wounds are contaminated, and the longer they are left unexcised the greater the risk of the subject's death from sepsis. In-driven bone fragments are a potent source of something worse than mere morbidity; all should be removed. During the last war I had cultures taken from them, and they were always infected, sometimes with *B. welchii*.

I have nothing except unfavourable things to say of leaving head wounds untreated for two or three days, although there was a time when that policy was advised. It was based on imperfect understanding of the subject. The mortality of gunshot wounds of the head is found to rise step by step with the time that has elapsed between the receipt of the wound and the operation. The death rate is notably higher where operation has been delayed beyond twenty-four to thirty-six hours. In times of great stress such delays are unfortunately difficult to avoid, but the ideal of the earliest possible operation in order to minimize sepsis must always be borne in mind. This necessitates careful planning of transport and operating facilities by the administrative staff.

Dura Mater as Barrier to Infection

The dura mater is the important barrier against the spread of infection to the brain: when it is intact the prognosis is good, and when it is torn the outlook is more serious. All cases can therefore be divided into two large prognostic groups according to the integrity of the dura mater; in times of emergency it may be difficult to decide which group to operate on first—the cases of greater urgency or those which are more likely to make a good recovery.

There is a tendency to plan treatment for the most severe injuries, assuming that these are much the most common. But in a series of 220 cases which I reported after the great war there were 54 pure scalp wounds, 53 compound fractures without dural penetration, and 113 with laceration of the dura. There was no mortality in the first two groups, all the patients having been operated upon. I can recollect, however, that deaths were reported elsewhere in some cases without dural penetration. The cause of death was either severe cerebral contusion or the late development of a cerebral abscess. In the penetrating group the mortality was 37.8 per cent. This is a very much higher mortality than that of civilian depressed fractures with dural tears and cerebral laceration. The reason is that the civilian cases are cleaner bacteriologically and that the injury is more superficial, even though it may involve a considerable surface area.

X-ray Examination

Even in difficult times it was usually possible for radiographic pictures to be taken. Unless it is known for certain not only whether a missile lies within the skull but where it is and what is its size, it is impossible to operate except in a haphazard way. To search for a foreign body that is not there is as bad as or worse than leaving one behind. A missile may have penetrated the falx and be in so silent an area of the opposite hemisphere that its presence could not be suspected until infection caused it to declare itself too late to allow of useful treatment. Nor is it the wounding missile alone about which information is sought. The number and position of in-driven bone fragments has to be accurately charted, for only thus can it be known what is to be done and in what direction the fractured portions are to be sought. With this information and with the knowledge of the clinical signs the operation may be intelligently commenced.

Pre-operative Preparations

No case should be operated on until recovered from primary shock. This is rarely present in local wounds of the skull (though common in the first stages of closed injuries), unless it be due to exposure or loss of blood from the vascular scalp. The condition of the patient can be

greatly altered for the worse by the presence of associated injuries; it may be these that sway the balance against him rather than the head wound.

Head injuries rarely call for blood transfusions in healthy soldiers, but multiple injuries may necessitate it, and blood will be available chiefly from the blood banks. It might be more needed for civilians. There may be difficulty in deciding which injury is most in want of operative treatment; but, faced with the actual case, the urgency of one particular wound will generally declare itself. If the patient is fully conscious, or very restless but not comatose, he should be given an injection of omnopon 1/3 grain and scopolamine 1/300 grain an hour before the operation. The amounts of the drugs must be decided, of course, by the general condition of the patient; in a cyanosed or uncontrollably restless man they will be omitted and an ether anaesthetic administered. Just before the operation, when the patient is sleepy, the whole head should be shaved: local shavings often lead to inadequate exposures and difficulties in post-operative dressings. Before this time careful radiological studies of the wound ought to be made.

Anaesthesia

Local anaesthesia is by far the most satisfactory method. A 1 per cent. solution of novocain with five drops of adrenaline to one ounce of the solution should be injected under the galea until a wheal half an inch high is raised; at first it should be so injected that the whole of the planned field is enclosed; further injections can be made if the primary incisions need enlarging. Apart from the large meningeal vessels and the basal dura mater, the whole operation field will be rendered insensitive. The temporal muscle should be liberally infiltrated if the operative field encroaches on this region. It is a wise plan to infiltrate the scalp widely, because incisions often have to be carried further than is at first apparent.

Position on the Table

The patient should lie comfortably on his back or face, according to the position of the wound; the head should be slightly raised above the level of the rest of the body to prevent venous congestion and turned to the appropriate side. His wrists should be tethered to the table but given two or three inches of freedom, and the towels be so draped that he has a free air-way. Restlessness under local anaesthesia is often due to a feeling of suffocation or to overheating, and these two things must be avoided. The field of operation must be easily accessible if unnecessary difficulties are to be prevented. Correct positioning on the table marks a distinction between those who are experienced in injuries of the head and those who are not. A tray for instruments should be placed across the table, clearing the upper part of the patient's chest by some six or more inches. Such a tray may be fixed to the table as part of its mobile equipment or be on a stand alongside. By draping the towels over it a tent is made, allowing of access to the patient's mouth and nose. Oxygen can be given by pinning a funnel attached to a cylinder to the covers inside this tent. An arrangement of this sort is most important. If towels are wetted in mercury perchloride solution, or become wet as the operation proceeds and cling about the patient's face, they cause him such respiratory embarrassment that it will be impossible to do good surgery. There is much in favour of using wet towels, wrung out of 1 in 2,000 mercurial solution, in place of the dry ones usual in civilian aseptic surgery. Four should be arranged to leave a square enclosing the operation field. Wet towels are more easily draped to the contour of the head and do not slip easily. A stitch or two may be used to fix them. Practice teaches how best to do this. All towels are arranged to run off the patient's head on to the tray before mentioned, and the whole covered with a dry sheet, with an opening eight inches in diameter near one end to give access to the wound.

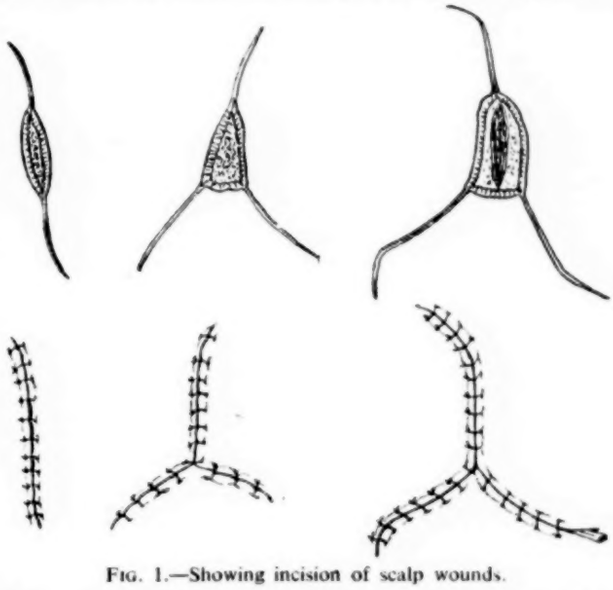

FIG. 1.—Showing incision of scalp wounds.

The Scalp

The incision will necessarily be determined by the shape of the scalp wound; its dimensions will depend on what is required for the exposure of the bone or brain. The edges of the scalp wound must be sparingly excised, and it is in this phase of the operation that excessive blood loss may take place if the skin is not adequately exsanguinated by digital compression until bleeding points can be controlled by haemostats. If no deeper injury is disclosed no more is necessary, but when the excision is only the first step in a bigger operation, extension will be needed.

It is the custom in surgical textbooks to display diagrams of plastic incisions to allow of the closure of scalp wounds. Most of these are bad. It is a simple enough matter to illustrate long tension incisions through the whole thickness of the scalp to allow of wound approximation, or to indicate sliding flaps of different sorts with the same object. In practice, however, each incision leads to severe bleeding, and there is no way of stopping it except by sewing the skin of the gaps down to the galea—a tedious and unsatisfactory process. Indeed, the briefest experience with such methods leads to their abandonment.

The triradiate has been proved the most generally useful incision (Fig. 1). Its advantages are that an adequate exposure can always be obtained; the minimum of gape occurs if the wound breaks down, and drainage tubes can be conveniently placed. A glance at the diagrams will make the principle plain; the sketch illustrates the very long incision needed to close some wounds, but not all. Any type of incision except the triradiate will rarely be needed. Semicircular skin flaps such as are made in neurosurgery for the turning of osteoplastic flaps are best avoided. They may have to be used in the temporal and occipital regions where the triradiate incision is unsuitable, as a limb would have to be carried on to the face or neck. In the former the limb is cosmetically bad; in the latter the tissues are stiff, fatty, fibrous, and vascular.

(To be concluded in next week's issue.)

ONE HUNDRED AND SEVENTH ANNUAL MEETING

of the

British Medical Association

HELD IN ABERDEEN, JULY, 1939

THE SECTIONS

SUMMARY OF PROCEEDINGS

During the next few months there will be published in the BRITISH MEDICAL JOURNAL *most of the opening papers communicated to the Scientific Sections of the Annual Meeting at Aberdeen. The reports of discussions, continued from last week (p. 304), are intended to give members who were not present a general idea of the proceedings.*

SECTION OF SURGERY

Thursday, July 27

Intractable Pain

With Professor J. R. LEARMONTH (Aberdeen) presiding, Mr. NORMAN M. DOTT (Edinburgh) opened a discussion on the treatment of intractable pain. Pain, said Mr. Dott, was an affective experience significant of grievous bodily harm, a special sense with its own end-organs, its own pathways, and its own place of conscious interpretation around the lateral nucleus of the thalamus. Pain had two close associates, affective and cognitive, the former producing fear and distress, the latter allowing some analysis as to temperature, area of contact, and exact localization. He thought, as regards the general significance and value of pain, that it might be divided into "physiological pain," a protective measure, and "pathological pain." Intractable pain was of the latter type, and he would define it as pain whose cause could not be removed, or pain of long duration whether continuous or intermittent. Pathological pain stimuli arose in two principal ways. First, the abnormal stimulus could be sufficient in itself to cause pain directly. Secondly, an innocent stimulus, often a normal one, could become so perverted, augmented, or facilitated by pathological derangement of the pain mechanism and adjacent neural mechanisms as to become represented to consciousness as a severe pain. The two types could be traced side by side at different levels of the nervous system. At the peripheral nerve level there could be adequate pathological stimuli by somatic pain fibres, by vascular pain fibres, and by visceral pain fibres, while at this level augmentation depended upon the secondary reflex implication of blood vessels by an axon reflex (dilator) and by a spinal reflex (constrictor). At central nervous levels, from cord to cortex, augmentation was greater, so that hardly perceptible stimuli from the periphery could be translated into severe pain. In the central nervous system lesions of grey matter were more apt to be followed by pain induction or facilitation than lesions of white fibre tracts, the most frequent cause being gliosis following vascular lesions or trauma, disseminated sclerosis, syringomyelia, and gliosis around slowly growing intrinsic tumours. These central pains were susceptible to barometric changes. Spontaneous central pain might originate in relation to the pain pathway anywhere within the cord and up to the thalamus. Pain due to this cause was characteristically continuous and so chronic as to terminate only with life. There were several ways in which natural painless stimuli from the periphery could augment central pain—by deviation of cold or touch stimuli into the pain pathway, by undue radiation or leakage at synapses, or by the inhibiting influences of the cortico-thalamic pathway. Continuing, Mr. Dott said that thalamic pain-consciousness was also conditioned by the surrounding affective state, which depended on individual personality. As regards psychogenic pain, he believed in its existence. After tracing the localizing diagnosis of painful states, he said that the treatment of intractable pain was necessarily palliative—the treatment of a symptom, not a disease. Analgesics had their place, rarely as the mainstay but often as adjuvants. In local treatment the blocking of the pathways by which the pain travelled might be performed. This might be either above the responsible lesion or below, in the latter case blocking the innocent precipitating stimuli. The side effects of psychic tension and anxiety states could be helped by sedatives, particularly of the barbiturate series.

Mr. T. F. TODD (Manchester) dealt particularly with the intractable pain associated with inoperable carcinoma of the cervix uteri. His definition of intractable pain was a pain which prevented natural sleep. He described the results of intrathecal injections of absolute alcohol in forty-four cases of somatic pain in the distribution of the lumbar or sacral nerves, and seven cases of pelvic visceral pain associated with advancing malignancy. He had followed the technique of Ritchie Russell and emphasized the necessity for slow injection, taking about twenty seconds for each minim of alcohol and limiting the total amount to 1 c.cm. at any one sitting. Complications were few if the technique was careful. While he had seen transient retention of urine, incontinence of faeces, and occipital headache, he had had no cases of paralysis. In forty-three of the fifty-one cases he had had a satisfactory initial result. There was rarely any need for further injections, as the prognosis in his cases was so poor that most were dead in a few months. Failures were due to technical errors. A contraindication was in patients with established morphinism. The craving for morphine soon returned. Again, several observers had reported the deleterious effects of absolute alcohol on the spinal nerve roots and on the posterior columns. For that reason he thought that alcohol injections should be administered only to patients suffering from advanced malignancy.

Mr. J. B. OLDHAM (Liverpool) described his experience of the results of denervation of the kidney for renal pain in cases in which careful urological investigation had failed to reveal any gross abnormality of the kidney or its function. There were no secretory nerves to the kidney. The renal nerves were vasomotor nerves and nerves to the musculature of the kidney. There were a series of ring muscles encircling the bases of the papillae, the necks of the calices, and the uretero-pelvic junction. Normally these sphincters were tonically contracted. Denervation of the kidney was not attended by any ill effects, and favourable results might be expected where pain of unknown origin demanded relief and in renal pain associated with hydronephrosis or nephroptosis. He did not advocate the operation in cases of general visceroptosis. After denervation of the kidney its secretion was markedly diminished for a day or two, then rapidly increased to more than normal. In carefully selected and investigated cases he had had excellent results.

Mr. G. F. ROWBOTHAM (Manchester) spoke of the treatment of the pain of trigeminal neuralgia. He described the various surgical procedures—by injection of the divisions or ganglion of the nerve, by posterior root section in the middle and posterior fossae, and by division of the trigeminal tract in the medulla. While the last-mentioned operation had the advantage of not leaving the face unpleasantly numb, it was a relatively dangerous procedure. Fractional root section by the lateral route was in his opinion the best procedure, provided the pain was not in the ophthalmic fibres. The slightest technical error in the posterior fossa approach was likely to lead to a fatality. In reply to a query from Mr. D. W. C. NORTHFIELD, Mr. Rowbotham said he thought that keratitis was a little more common after alcohol injection.

Professor LAMBERT ROGERS (Cardiff) mentioned the use of thyroid extract in the prevention of keratitis following operation or injection. It was an empirical procedure. Dr. GERALD SLOT spoke of injecting A.B.A. solution into the Gasserian ganglion. Mr. C. F. MAYNE (Plymouth) asked for advice in the treatment of the severe pain associated with malignant disease of the pancreas, and Professor ILLINGWORTH (Glasgow) cited such a case in which the pain had totally disappeared after a laparotomy in which he had removed a small piece

for section. He thought the result was due to the relief of tension. Dr. P. W. R. PETRIE (Loanhead), as a psychologist, agreed with Mr. Dott on the subject of psychogenic pain, and narrated the personal experience of a continuous headache which cleared up on his making an apology which he felt he ought to make though he was unwilling to do so. Mr. NORMAN LAKE rather doubted if pain had any real protective value. He also wondered if another word could not be found as a substitute for the word "pain," which was inculcated into children from an early date, and probably made increased difficulties in later life. Dr. W. MCK. CRAIG (Mayo Clinic) spoke of the importance of assessing the patient's threshold of pain and of differentiating between organic and psychogenic pain.

At the same meeting two occasional papers were read. Mr. A. M. RENNIE (Aberdeen) described congenital arteriovenous fistulae, and showed a coloured film of a case. Mr. D. L. C. BINGHAM (Edinburgh) spoke on the principles of fluid administration, emphasizing the importance of water balance as distinct from the giving of saline. Water deprivation and dehydration were two different entities needing different methods of treatment.

SECTION OF MEDICINE

Thursday, July 27

Medical Treatment of Peptic Ulcer

With the President, Dr. A. GREIG ANDERSON, in the chair, Professor EINAR MEULENGRACHT (Copenhagen) opened a discussion on the medical treatment of peptic ulcer and its complications. Professor Meulengracht's paper is published in this issue at page 321.

Dr. T. L. HARDY (Birmingham), after paying a tribute to Professor Meulengracht's notable contribution to the treatment of bleeding peptic ulcer, dealt with the basic principles underlying ulcer treatment—namely, rest, relaxation, and food. With regard to food, the only contraindication was painful dyspepsia, but this rarely lasted more than a week; thereafter there was no good reason for continuing a strict ulcer diet, which rarely had a calorie value exceeding 1,700 and which was unattractive to a patient whose digestion and appetite were often excellent. Most hospital patients suffered from mild chronic malnutrition; undernourishment and lack of vitamin C were often present in patients with peptic ulcer. He saw no reason for prohibiting alcohol permanently, and he would allow beer, white wine, or diluted whisky at meal times. Tobacco was best avoided entirely. He regarded peptic ulcer as a recurring disease in at least half the cases, and a long-term policy was essential in treatment. Constitutional factors over which we had no control often operated, and emotional stresses, focal and catarrhal infections, and gastric trauma and hyperacidity were all important. The speaker advocated as a general rule one month of rest in bed, preferably in an institution, and subsequently planned rest. Unfortunately, patients tended to break down at times of physical or emotional stress, and management was thus rendered difficult in the home environment. With reference to drugs, small regular doses of phenobarbitone or bromide were preferable in many cases to any amount of antacids.

Dr. A. LEESE (Oxford) gave an account of work done with Dr. A. K. Black on nitrogen and chloride metabolism in haematemesis. In three cases studies had been made of the intake and output of these elements and of nitrogen partition in the urine. His results suggested that a breakdown of body protein contributed to the elevation of the blood urea in haematemesis, other factors being absorption of nitrogenous material from the blood in the bowel and a depressed renal function. These findings supported the therapeutic value of a liberal diet with liberal fluids by mouth. The blood urea gradually diminished during recovery from haematemesis. Studies on blood chlorides had not given uniform results.

Dr. T. N. MORGAN (Aberdeen) had for the past eighteen months treated cases of haematemesis and melaena of all degrees on the principle of immediate feeding, the soft purée diet described by Witts being employed. In no case had there been recurrence of bleeding while the patient was in hospital. Under the older methods weight loss, dehydration, and uraemia had been the rule. The blood urea was apt to be raised irrespective of the presence of pyloric stenosis. A series of observations had been made upon patients with moderately severe blood loss and with only slight vomiting and no renal or pyloric disorder; on treatment such as that in use before the introduction of the Meulengracht regime it was found that the blood volume, originally diminished, became normal in forty-eight hours; the blood urea was maximal twenty-four hours after the bleeding; the renal function was poor at first and gradually improved over a period of eight or nine days; there was a negative nitrogen balance. In addition, there was loss of weight and deterioration in the general condition. Dr. Morgan inferred from these observations that the increased blood urea was in part due to renal inefficiency, that the estimation of blood urea was of value in assessing progress in haematemesis, and that the existence of a negative nitrogen balance provided a rational basis for the liberal diet and fluids advocated by Professor Meulengracht.

Dr. BRUCE M. NICOL (Aberdeen) described the results of his investigations on the effect of diet and medicinal treatment upon hyperacidity in peptic ulceration. He had found that adequate control of the free acidity of the gastric contents could not be obtained by hourly or two-hourly feeding, either alone or in conjunction with large doses of atropine or antacids. The failure of hourly feeds of milk in this respect was due largely to the rapid passage of the milk out of the stomach. Two-hourly feeds of a mechanically non-irritating type and containing more protein were superior to hourly feeds of milk and puddings in the control of gastric acidity. Atropine should only be used when there were indications of pyloric spasm, since it failed to influence gastric acidity. Experience of treating patients in bed, without dietary restrictions, indicated that the attainment of physical and psychological rest was of more importance in obtaining healing of ulcers than any rigid dietary regime or the use of alkalis and atropine.

Dr. S. W. PATTERSON (Ruthin Castle) thought that he dealt with fewer admissions for the crises of peptic ulcer, such as perforation and haemorrhage, than a general hospital, but he had greater opportunities for adequate treatment and follow-up. Of 133 consecutive admissions for peptic ulcer, fifteen were admitted for diagnosis only. Of the remaining 118, twenty-four were judged to require operation and ninety-four were considered suitable for medical treatment. The indications for operation were as follows: chronic ulcer (requiring gastrectomy), gastric delay, associated gall-bladder disease, associated disease of the appendix, and considerations of safety. For full medical treatment the patient needed four weeks' rest in bed; feeding began with continuous sipping of egg and milk, followed in a few days by semi-solids. The aim was to secure a constant stream of soft easily digested food through the stomach. Adequate cleansing of the mouth and teeth, the avoidance of tobacco, and suitable after-care were important. Of sixty-nine patients receiving full treatment, forty-nine did well subsequently but twenty relapsed. Relapse was mainly due to relaxation of care regarding diet, tobacco, and alcohol, and to fatigue or anxiety.

Mr. J. JACQUES SPIRA held that there had been little progress in the investigation of the aetiology of ulcer during the last fifteen years. He considered that acute and chronic ulcers were distinct entities and not interrelated. The production of chronic ulceration depended upon breakdown of the pyloric mechanism, which, physiologically, should not allow regurgitation. The genesis of such ulcers might be summarized in the following way: fat in the stomach provoked retroperistalsis and regurgitation of bile; bile salts were toxic to extrabiliary tissues, and in the presence of hydrochloric acid irritated the gastric mucosa, causing hyperacidity and closure of the pylorus; hyperacidity evoked further regurgitation, and so a vicious circle was set up, leading ultimately to gastric erosions and ulceration.

Dr. A. T. M. WILSON had compared two hundred cases of peptic ulcer with a suitable control group. Before their illness 84 per cent. of the ulcer patients had shown signs of chronic psychological tension above the average; this was generally an abnormal and only partly recognized fear of insecurity. This fact was the basis of a new conception regarding the genesis of ulcer; certain personality types were repeatedly driven, or led, by their psychological make-up into situations which were capable of producing emotional states in all of us, but the ulcer patients were those who showed a special degree of sensitivity. If this psychological background of ulcer production were accepted, the prognosis of ulcer became largely the prognosis of the state of emotional tension. It was curious that patients often showed no insight regarding the relation of gastric disturbances to factors in the environment when the connexion was obvious to the doctor and the relatives.

Dr. LAURANCE D. W. SCOTT (Glasgow) related his experience with the method of immediate feeding in Professor McNee's wards. Necropsy studies of sixty patients who had died with haematemesis from ulcer showed that two-thirds had chronic ulcers, and half of these had eroded the pancreas or neighbouring structures. He doubted whether a purée diet could have influenced the outcome in these instances. Professor L. S. P. DAVIDSON (Edinburgh) observed that it was easy enough to cure peptic ulcer patients by the provision of physical and psychological rest and a suitable diet, but the problem of keeping them well was another matter. Dr. Nicol had analysed 500 of his cases and had found that 50 per cent. relapsed within five years; he considered that there always would be a high relapse rate. Although bed rest was advisable as a general rule, many cases could be cured by ambulatory treatment, and should be so treated if admission to hospital would cause anxiety. With regard to operative treatment, he felt that the chance of recovery from the bleeding was so good and the chance of recovery from operation so poor that he never advocated operation unless medical measures and repeated transfusion had been tried.

Professor R. S. AITKEN (Aberdeen) deprecated the free use of atropine in peptic ulcer. There were circumstances in which this drug did more harm than good. During after-treatment patients were often given tablets of 1/100 grain to take if bothered by pain. In this way a warning signal was abolished and the patient was enabled to force the pace when he should be relaxing. Mr. HAROLD DODD submitted that surgery had a useful contribution to make in the management of chronic peptic ulcer by the removal of septic foci, such as the appendix, tonsils, and gall-bladder. Infection in the antrum or Fallopian tubes might also require surgical treatment. For the chronic ulcer of over five years' standing, and for the anastomotic ulcer, no amount of rest, diet, or psychological treatment would give permanent relief, whereas a carefully planned operation might bring freedom from dyspepsia and a better condition of life.

Professor A. GREIG ANDERSON (Aberdeen) laid stress on the situation of the ulcer. An irregularity shown radiologically on the greater curvature always meant malignancy, and such patients should never be treated medically but always explored. Only about one in twenty ulcers in the pars intermedia became malignant, whereas three out of four ulcers appearing in the pyloric antrum in middle age developed malignant changes. Ulcers in the last situation should not receive medical treatment for more than a month or two unless radiological and gastroscopic evidence pointed to healing.

SECTION OF OBSTETRICS AND GYNAECOLOGY

Thursday, July 27

Post-partum Haemorrhage

With Professor R. W. JOHNSTONE (Edinburgh), President of the Section, in the chair, Dr. R. H. J. M. CORBET (Dublin) read a paper on post-partum haemorrhage. He described the mechanism of separation of the placenta, and suggested that the Schultz method rather than that of Matthews Duncan was the normal one. Post-partum haemorrhage could be divided into three classes: (1) placental site haemorrhage, due to premature separation of the placental margin; (2) true atonic haemorrhage, where there was no bleeding till after delivery of the placenta; (3) traumatic haemorrhage, where the bleeding came from lacerations in some part of the birth canal. Premature separation was held to be the cause of the first type of haemorrhage. The practice in his hospital was not to touch the fundus until there were signs of placental separation. Mismanagement of the third stage, particularly premature attempts to express the placenta before it had separated, was one of the main causes of post-partum haemorrhage. Operative obstetrics associated with prolonged anaesthesia were also contributory factors. Morbid adhesion of the placenta was a rare complication. A loss of blood of over 500 c.cm. was considered pathological. It was the slow but cumulative loss of blood that mattered, not the sudden loss. He stressed the importance of treatment of shock. Persistent attempts at Credé's manipulation would increase not only the shock but also the bleeding. Injection of the umbilical cord with saline was successful in one-third of the cases in which this treatment had been used. In the presence of active bleeding then, manual removal was essential. After removal of the placenta he packed the uterus with iodoform gauze. In atonic bleeding he relied on oxytocic drugs in the first instance. Post-partum haemorrhage resulted in a maternal mortality of 6.3 per cent. in England and Wales, whereas in Scotland it was 3.9 per cent. The incidence of manual removal was 0.5 per cent. in his hospital.

Professor JAMES HENDRY (Glasgow) had analysed 1,000 successive labours at the Glasgow Maternity Hospital. He was able to classify the cases of post-partum haemorrhage into three grades. In Grade 1 the bleeding was a little more than the normal; in Grade 2 compression of the uterus was necessary; in Grade 3 blood transfusion and other restorative measures were needed. Long labour, provided it ended spontaneously, did not predispose to post-partum haemorrhage. In Grade 1 haemorrhage was more frequent in first and second labours (22.5 per cent.), less common in third, fourth, and fifth labours, but increased in frequency after this with increasing parity. In Grade 3 bleeding was not influenced by parity. Analgesics or light anaesthesia did not increase but tended rather to diminish bleeding in the third stage. However, morphine did not come out of this test well; there was more bleeding when it had been given. Spinal anaesthesia reduced the loss of blood quite definitely. With ether there was a greater tendency to bleeding. He emphasized the importance during labour of giving adequate food, particularly in the form of glucose, and nerve sedatives. "Hands off the uterus" was his slogan for the proper conduct of the third stage. He saw no harm in giving pituitrin immediately after the birth of the child in cases of operative delivery. He described his manœuvre for controlling haemorrhage. By pulling the uterus upwards the blood flowing through the uterine vessels could be controlled. Blood transfusion had reduced the mortality from post-partum haemorrhage in his clinic by 20 per cent.

Dr. E. K. MACKENZIE (Tain) spoke as a general practitioner who had been in practice for over thirty-three years and was 150 miles from a maternity hospital. He quoted from detailed notes of 1,381 cases. In twenty-seven of these women he had had to remove the placenta manually because of its adherence to the uterus, but in no case because of post-partum haemorrhage, although in one case severe haemorrhage followed removal of the placenta. The incidence of post-partum haemorrhage was 2.3 per cent. In all cases the patient was exhausted as the result of her labour. He advocated induction of labour at full term, as he felt an over-big child exhausted the mother during its delivery. Where the transverse diameter of the outlet was less than 3½ inches it was wiser for the delivery to take place at an institution and to be dealt with by operation. As a prophylactic measure against bleeding he used 1/6 grain morphine and 1/150 grain hyoscine every six to eight hours during labour. In occipito-posterior positions he did not interfere; intervention in such cases might predispose to haemorrhage. In 97 per cent. of

his deliveries last year he had given pituitrin immediately after the birth of the child. So far he had no cause to regret this form of treatment.

Professor E. FARQUHAR MURRAY (Newcastle-upon-Tyne) stated that mismanagement of the third stage was a prolific cause of bleeding. A study of some hundreds of cases of incomplete B.B.A.s on the hospital district, where the baby had been born but the placenta had not come away by the time the nurse arrived, showed that in only one instance was a slight post-partum haemorrhage noted. He preferred delivery in the lithotomy or cross-bed position, and in normal cases never allowed the uterus to be touched. It should be remembered that a blood clot, however small, represented several ounces of blood. Frequently the placenta was not removed until it was too late. In those rare and unaccountable haemorrhages from an apparently normal and empty uterus they might be due to the presence of some unusually large arterial trunks in close proximity to the placental site. He was against packing the uterus. Many of the cases at present treated by blood transfusion would do equally well if they were given gum or glucose saline.

Dame LOUISE MCILROY said that complications in the third stage of labour were often caused by bad management of normal cases. She had never found morphine to cause post-partum haemorrhage. She deplored the way patients were starved during labour. They should have light meals and plenty of fluids. Glycerin injections into the uterus after the placenta had been delivered were excellent for stopping haemorrhage. In rural areas blood transfusion was not available, but in emergency cases saline injected under the breasts or into the rectum was a good substitute.

Sir BECKWITH WHITEHOUSE (Birmingham) referred to the low mortality in Scotland following post-partum haemorrhage as compared with double the figure in England and the U.S.A. This was a tribute to the obstetricians north of the Border, and to the care and absence of hurry with which the third stage was conducted. He endorsed the use of pituitrin before delivery of the placenta should the haemorrhage occur from a partially separated placenta, but would emphasize that after the bleeding had been controlled by pituitrin there was no need to proceed immediately to delivery of the placenta. Too often there was the tendency to interfere for the mental satisfaction of returning the patient to bed with the uterus empty. On several occasions he had left the placenta *in situ* for twenty-four and in some cases forty-eight hours after an exhausting labour. At the end of this time the placenta had been expelled spontaneously. Pituitrin should be injected directly into the uterus via the abdominal wall. Intra-uterine injection of hot glycerin as a method of controlling haemorrhage should be more widely used. Placenta accreta, fortunately a rare condition, was best treated by hysterectomy at the appropriate moment.

Professor DUGALD BAIRD (Aberdeen) said that in 1938 in his clinic the placenta had to be removed manually in six cases out of 1,000 deliveries. He advocated spinal anaesthesia for forceps delivery, and disapproved of intra-uterine douches. The importance of ante-natal treatment of anaemia was often overlooked. Professor J. B. DAWSON (Otago) was sorry that the pendulum had swung from over-control of the uterus in the third stage to no control at all. He was in favour of tactile observation rather than visual. The hand palpating but not massaging could detect good retraction and so anticipate bleeding. Injection of oxytocic drugs directly into the uterus was a very valuable procedure. Sir EWEN MACLEAN (Cardiff) was gratified to note that the figures submitted by Professor Hendry showed that the cases in which analgesia had been induced by gas-and-air had no untoward results. He very much regretted the resolution recently passed by the Representative Body of the British Medical Association regarding the administration of gas-and-air by midwives. In England and Wales 65 per cent. of maternity cases were attended by midwives, whereas in Scotland a large proportion of cases were attended by doctors. Dr. H. R. FREDERICK (Port Talbot) found the variety of views expressed consoling to him as a general practitioner; the bad results attributed to general practitioners were not always justifiable. The consultant was not aware sometimes of the difficulties to be found in general practice. Professor JOHNSTONE (Edinburgh), commenting on the divergence of opinions expressed, did not think there was any harm in the hand being placed lightly on the fundus before delivery of the placenta. Miss BEATRICE TURNER described her technique of injection of glycerin in preference to a douche. She was a strong advocate of gas-and-air (or oxygen) analgesia. It did not lengthen the second stage. Mr. W. C. W. NIXON commented on Dr. Mackenzie's figures of manual removal of the placenta in the absence of haemorrhage. If there was no bleeding, what danger was there, he asked, in leaving the placenta *in situ* provided the patient's condition was satisfactory rather than embark on one of the most dangerous of obstetrical operations?

Dr. R. H. J. M. CORBET, in reply, said that there was a tendency while the hand was on the fundus to start massaging. There might be a tendency to shock if the placenta were left in too long. He did not agree with Professor Hendry that morphine predisposed to haemorrhage. He agreed with Dr. Mackenzie in the treatment of occipito-posterior positions. In contradistinction to Professor Murray, he found that B.B.A. cases sometimes had severe haemorrhage. He sympathized with the general practitioner in the difficulties he was faced with in his practice of obstetrics, and was pleased that Professor Baird had stressed the importance of treating anaemia in the ante-natal period. In cases of lacerations packing was very useful.

SECTION OF OPHTHALMOLOGY

Thursday, July 27

Ophthalmic Services in Emergency

With the president of the Section, Dr. W. CLARK SOUTER, in the chair, Colonel A. IRVINE-FORTESCUE (Aberdeen) opened the discussion on ophthalmic services to the civil population in national emergency. Confining himself to the administrative side, he pointed out that the conditions which would prevail in Britain during the next war could best be realized by studying reports of the recent war in Spain. Big cities appeared to be particularly the objects of attack. The possibility had to be considered that air attacks might come with extreme suddenness, allowing for no warning and involving heavy casualties. In Barcelona one particular attack under such conditions resulted in 1,000 casualties. It is anticipated that air raids during the next war would be more intensive than those made on Spanish cities, and there was the possibility of gas bombs being used. Should mustard gas be used there would be vast numbers of people temporarily blinded who would require hospital treatment for some days. Provision on an appropriate scale for such an emergency did not appear to have been made. Arrangements for special bed accommodation and for an increased auxiliary nursing personnel trained specially in eye irrigation were imperative.

MR. ARNOLD SORSBY, dealing with the clinical aspects, pointed out that modern warfare carried the evil promise of two new principles: the terrorization of the civil population and the "Blitzkrieg," the lightning war. As a consequence it was expected that the first few weeks after the outbreak of hostilities would involve heavy civilian casualties from air raids in which every possible means of destruction would be employed—poison gas and incendiary bombs no less than heavy explosives. The organization of a medical service was therefore essentially a question of dealing with air raid casualties. Experience in Spain and China had shown that minor and isolated injuries were likely to be uncommon. Any organization for special ophthalmic services would thus be of limited value. It was, however, planned to have ophthalmic talent distributed widely. Experience of ocular injuries from gas was limited. During the great war most of the eye injuries from gas were of a minor character. The effect of gas on the cornea was proportional to its concentration, and in its fluid form the action was instantaneous. With the

dilutions used during the war there was a latent period of six to eight hours. In the early stages of gas warfare the damaged eyes used to be bandaged; this practice was discarded later on. The lesions from incendiary bombs were not likely to be different from burns seen in civil life. Heavy explosives generally damaged the eye beyond repair, and even when a retained foreign body was removed the eye was usually lost.

Professor A. J. BALLANTYNE (Glasgow) observed that first-aid posts were not equipped for dealing with eye injuries. The personnel should, however, be made interested in this aspect. Eyes exposed to irritant or vesicant gases should be irrigated. In Barcelona eye injury by metal splinters was comparatively rare, in most cases fragments of stone scattered with great velocity by high explosives being responsible. He suggested that each surgeon should consider himself an individual mobile unit, carrying in his car a minimum of equipment for first aid. A.R.P. authorities might find it worth while to encourage such voluntary developments.

Mr. W. J. B. RIDDELL (Glasgow) asked if there was any objection to the use of cocaine in the emergency treatment of gas casualties, and stressed the relative lack of permanent damage from gas in the last war—a point also made by Mr. H. CAIGER (Sheffield). Dr. E. J. PRIMROSE (Glasgow) stressed the value of irrigation in gas injuries. Miss IDA C. MANN thought that any disadvantages arising from the use of cocaine were counterbalanced by the psychological effect of the patient being able to open his eyes. She thought paroleine drops were preferable to castor oil in first-aid outfits, as it was not liable to contain the intensely irritating free ricin. Mr. FREDERICK RIDLEY stressed the need for unequivocal knowledge of the value of lavage in gas injuries to the eye. In this he was supported by Mr. O. G. MORGAN. Mr. R. RAMSAY GARDEN (Bristol) stressed the advisability of decontaminating the skin of the lids before conjunctival lavage. Mr. J. A. CORKEY (Belfast) emphasized the value of goggles as preventive measures against both gas and incendiary bombs. Dr. H. E. SMITH (Aberdeen) described from personal experience the disorganization of prearranged services during an air raid, and Mr. J. R. MUTCH (Aberdeen) discussed the nature of gas injuries to the eye.

A Resolution

Following a suggestion from Professor BALLANTYNE, Mr. A. R. MOODIE (Dundee) moved and Mr. J. A. MORTIMER (Glasgow) seconded a resolution asking the Council of the British Medical Association to appoint a committee to consider the organization of ophthalmic services to the civil population in national emergency. After a lengthy discussion, in which many speakers took part, the resolution was replaced by this amendment, moved by Mr. RIDLEY: "That this discussion has revealed wide gaps in the organization of ophthalmic services in the event of a national emergency. The Council of the British Medical Association are urged to investigate and remedy these deficiencies."

SECTION OF PUBLIC HEALTH AND HYGIENE

Thursday, July 27

Medicine and the State: The Future of Practice in Medicine

With Dr. J. M. MACKINTOSH (Edinburgh), President of the Section, in the chair, a discussion on medicine and the State was opened by Dr. ANDREW TOPPING.

Dr. Topping, whose address will be published in full in due course in the *Supplement* to this *Journal*, said that since the State began to take a share in measures designed to lessen disease and to improve treatment, a degree of progress which would have been unbelievable forty years ago had been achieved, and extended control by the State would be productive of good to the public and to the profession. Moreover, the majority of private practitioners already derived a substantial part of their incomes from State funds, and extension of the system, with the practitioner drawing a salary for full-time work, would be comparatively simple in most areas. Many consultants and practitioners deplored existing conditions. The State had usurped most of the important and lucrative features of their practices, and they felt that they ought to be identified more directly with the State's activities.

Dr. W. G. BOOTH (Boston), who followed, said that out of the last century had come a new medicine—a combination of the scientific knowledge of the nineteenth century and education of the public. Health measures that had recently been placed on the Statute book indicated that it was the will of the people that medical skill and knowledge should be made available to all and, further, that there was a preference for health problems to be dealt with through the public health service rather than the practitioner. Under present conditions of private practice it was difficult to secure the essential services of laboratory and hospital for the average patient, and this was not compensated by the personal interest of the private doctor in his patient. Some form of State medical service was inevitable, and the so-called encroachments on private practice had already lessened the value of the practitioner as a medical unit, while the power of the practitioner to negotiate good terms for himself depended upon his value as a part of the complete service. The basis of the B.M.A. scheme was free choice of doctor and the stimulus of competition for patients. Free choice could only mean that the popular doctor was overworked, and the proper stimulus should come not from numerical increase of patients but from the desire to reach higher appointment by study and experience. The income limit as proposed in the B.M.A. scheme was an anachronism; it was an attempt to put the clock of public feeling back to the days of medical charity.

Dr. H. J. RAE (Aberdeen) described the regional medical services scheme of the North-East of Scotland. The health services of the City of Aberdeen and of the counties of Aberdeen and Kincardine had been amalgamated under one medical officer of health. The area provided an administration unit of reasonable size and gave employment to whole-time divisional medical officers stationed in different areas; whole-time specialists were also available. Hospital services had been extended and placed on a more economic basis. The municipal and the voluntary hospitals were not in competition, but were complementary to each other, and the status of the municipal hospital was enhanced by the establishment of a centre for research and for teaching. Amalgamation and uniformity had been introduced into the public health services, while financial arrangement for outside authorities had been made on a satisfactory *per capita* basis. An effort was being made to include the general practitioner in the scheme, and to reinstate him as the family doctor responsible for the prevention of disease in the family, with the whole of the machinery provided by the local authority at his disposal. To secure this end meetings were arranged periodically between members of the Public Health Committee and of the local branch of the B.M.A. with a "liaison officer" (the medical officer of health) to discuss terms and conditions, as well as to act in an advisory capacity.

Dr. E. R. C. WALKER (Aberdeen) argued that from the standpoint of evolutionary biology the State must be regarded as an organization arising from fundamental human needs. It was in essence an attempt to alter environment favourably, and in so far as it did this the State would be stable and successful. The State and its individual members were mutually supportive and had a reciprocal duty. The more successful the State in fulfilling its function, the greater would be the mass of individual well-being or health. The greater the proportion of healthy individuals the more successfully would functions of State be fulfilled. It followed that in the wide sense all medicine, which by definition was the science and art of restoring and maintaining health, was the proper concern of the State. Medicine was a service and not a business—a defence service. Much of the opposition to so-called State medicine was aroused not so much by the general idea of State responsibility for medical services as by certain methods

proposed in the plans so far adumbrated. The proper procedure was first to decide on the basic issues, then to determine policy accordingly, and finally to select the plan which seemed to offer the best chance of successfully carrying out that policy.

Dr. W. ASTEN (Bournemouth) considered that the bogy of the word "State" as applied to medical service had retarded progress. We were still short of the ideal—namely, that sickness alone should be the qualification for treatment, and not the social status of the patient. He doubted the practicability of establishing *ad hoc* controlling boards; it would take a long time to convince existing public health committees or the electorate of the wisdom of such a scheme. Dr. J. D. SAGGAR (Dundee) contrasted the mortality figures in Scotland from the major infectious diseases before sanitary measures were enforced with those obtaining to-day, and argued that similar procedure should be followed in combating the social diseases still prevalent. Dr. L. KILROE (Rochdale) deprecated the tendency in matters of public health to criticize the general practitioner, who was already painfully aware of his shortcomings, and the B.M.A., which had always stood for a fair deal to *all* its members. The public health service had reason to be grateful to the B.M.A. for the benefits that had accrued from its activities in this direction. He pleaded for fuller co-operation between the two branches of medical service.

Dr. TOPPING, replying to the discussion, said he saw no difficulty in the financial arrangements, as the elimination of overlapping and concentration of the work would effect a very large saving in cost. The questions relating to duties and services were matters for negotiation. The CHAIRMAN in his closing remarks emphasized the broad and deep distinction between a salaried medical service and a State medical service; State control, he maintained, was incompatible with the traditions of medicine.

Health Organization of the League of Nations

Dr. M. D. MACKENZIE (Geneva), in a paper on the working of the Health Organization of the League of Nations, described its world-wide scope, the functions of the various special commissions, the aim and purpose of the interchanges of health officers, the travelling scholarships, and the organized study-tours.

Dr. J. J. PATERSON (Maidenhead) said he would like to emphasize three points mentioned in the paper: (1) the magnificent service rendered by the League in placing a barrier in the Near East against the invasion of the major infectious diseases that threatened Europe immediately after the war; (2) the example of "regional service" set up by the activities of the League which embraced the whole world; and (3) the League's demonstration, by individual and group exchanges, of the universality of the humanitarian principles that animated the public health service.

SECTION OF PHARMACOLOGY, THERAPEUTICS, AND ANAESTHETICS

Thursday, July 27

Anaesthesia in Dental Surgery

With Dr. J. ROSS MACKENZIE, Vice-President of the Section, in the chair, Dr. FREDA B. PRATT (Oxford) opened a discussion on this subject. Reviewing nitrous oxide anaesthesia in the absence of premedication in ambulant dental patients, she stated that difficulties might be experienced with the anaesthetic-resistant subject. To obtain surgical anaesthesia in this type of patient the oxygen intake had to be reduced to a level which resulted in muscular spasm and a dangerous degree of anoxia. Certain dangers and difficulties would be avoided if the significance of cyanosis was appreciated, and she stressed the fallacy of relying on cyanosis as a guide to the depth of nitrous oxide anaesthesia. Patients might be classified as plethoric, normal, and anaemic, according to their haemoglobin level. The anaemic patient was particularly susceptible to the action of any anaesthetic and, though it was often stated that nitrous oxide was unsuitable for such a case, the reverse was true. Nitrous oxide had acquired an unfavourable reputation in anaemic cases because the stages of anaesthesia were passed through rapidly without the muscular signs and the colour changes which were a feature of this type of anaesthesia in the average patient not given any premedication.

Dr. JOHN GILLIES (Edinburgh) discussed the psychological and physical aspects of dental anaesthesia and advocated induction by means of the face-piece rather than by purely nasal administration. From personal experience he regarded cyclopropane as a very satisfactory supplement to nitrous oxide and oxygen. Dr. W. S. MCCONNELL advocated the use of sodium evipan given intravenously to the ambulant dental patient in the upright position in the dental chair. He detailed his technique, and reviewed a series of these cases from the point of view of type of patient, age, and dosage. He mentioned the difficulty of obtaining satisfactory anaesthesia with nitrous oxide and oxygen in patients with a failing circulation.

Dr. A. H. MACKLIN (Dundee) stated that four criteria should be observed: (1) the dental surgeon must be given clear access to the field of operation; (2) the anaesthesia must be maintained for as long as the dentist desired; (3) the anaesthesia should be light and even; and (4) the ingestion of foreign matter should be prevented by packing the throat. These conditions could be fulfilled by administering intrapharyngeal nitrous oxide and oxygen through a nasal tube. He considered that it was necessary to produce some degree of cyanosis, and he believed that tissue asphyxia resulted from all forms of anaesthesia. Dr. BESSIE E. COOK (Doncaster) pleaded for a more extensive use of ethylene for dental anaesthesia. It was a more powerful agent than nitrous oxide and was very useful for children. She regarded the explosion hazard as overestimated. Dr. R. J. CLAUSEN, quoting from personal experience, did not recommend the use of ethylene. He asked if it was justifiable to carry out dental operations lasting twenty to thirty minutes in the dental chair.

Dr. H. W. FEATHERSTONE (Birmingham) preferred the use of nitrous oxide and oxygen administered by the nasal route. The addition of ether was useful for difficult patients. He believed that cyclopropane and sodium evipan should be used with care in dental work. Dr. A. BARNSLEY (Guildford) stated that it was easier to administer sodium evipan to a patient with small veins if the needle was detached from the syringe, was used to transfix the vein, and was then partly withdrawn. Mrs. RUTH E. MANSFIELD inquired regarding secondary saturation. She recommended a sublingual throat pack which had the effect of displacing the tongue backwards. Dr. JOHN CHALLIS, so far as children were concerned, recommended packing the throat with a small piece of gamgee tissue moistened with ether. He regarded sodium evipan as impracticable for clinic work. Dr. FREDA PRATT replied briefly to the points raised in the discussion.

Anaesthesia in Genito-urinary Surgery

Dr. T. A. B. HARRIS said that anaesthetic practice in genito-urinary surgery was conservative because the patient was usually a bad surgical risk. He regarded cases as falling into two groups. First were those in which diagnostic investigation was the primary object. In this group anaesthesia must be sufficient to prevent trauma which led to bleeding. Asphyxia also tended to produce bleeding, and deep anaesthesia, together with factors which diminished the renal blood flow, impeded secretion. If chloroform was not administered, light general anaesthesia was satisfactory provided asphyxia was avoided. Low spinal anaesthesia, however, was the method of choice, since it was efficient, did not diminish the renal blood flow, and did not produce asphyxia. In the second group were those cases in which it was proposed to carry out specific surgical intervention. Basal anaesthesia was desirable, and both avertin and sodium evipan were safe and satisfactory. Anaesthetic methods and drugs which predis-

posed towards anoxic, histotoxic, or stagnant anoxia in these patients led to cardiac decompensation, which often resulted in pulmonary complications or cardiac failure. Chloroform was unsuitable, and high spinal anaesthesia should be used with discretion. Although a correct choice of anaesthetic was of great importance, it was more important still to conduct the administration with careful attention to detail. Massage and re-educational breathing exercises together with the intelligent use of oxygen and blood transfusion held a certain promise of a reduction of mortality during convalescence.

Dr. R. J. CLAUSEN said that endotracheal anaesthesia was seldom required in genito-urinary surgery, and spinal anaesthesia could be employed in all cases. The poor general condition of many patients necessitated the use of the least toxic agents, and both regional and local methods might be used more often. He had found spinal anaesthesia with percaine 1 in 1,500 very useful in renal operations, but he had not tried this method extensively in prostatectomy. For the latter, ethylene–oxygen had been very valuable and had proved adequate in nearly 70 per cent. of cases. Of 540 genito-urinary cases during the past three and a half years about 60 per cent. were given ethylene–oxygen, 18 per cent. ether, and 13 per cent. spinal and 3 per cent. local anaesthesia. Chloroform was used on four occasions only. Dr. W. S. MCCONNELL considered the problem of maintaining anaesthesia for genito-urinary surgery in the "bad surgical risk," with particular regard to the depth of anaesthesia required to protect the patient from surgical shock and to the rate of recovery of consciousness. He advised nitrous oxide–oxygen with vinesthene as an adjuvant, and the addition of ether in certain types of operation. When avertin was used in an edentulous poor-risk patient it was most important to ensure that a proper airway was maintained.

Dr. P. M. OVERTON (Bolton) referred to his experience of 150 cases of epidural anaesthesia combined with the administration of nitrous oxide and oxygen. He employed upwards of 45 c.cm. of 2 per cent. novocain and he used Odom's indicator. There was a slight fall in blood pressure, and relaxation was comparable with that obtained in spinal anaesthesia. Dr. H. H. PINKERTON (Glasgow) said that he had found avertin with nitrous oxide and oxygen most satisfactory for genito-urinary surgery. For prostatectomy he used endotracheal ether with carbon dioxide absorption, but recently he had employed cyclopropane, and the only objection he had noted was a too rapid recovery of the patient. Dr. H. W. FEATHERSTONE (Birmingham) stated that the frail genito-urinary case required very careful handling. Ether was perfectly safe for the reasonably strong and fit patient.

Intratracheal Anaesthesia

Dr. ROSALIND M. P. MILNE (Aberdeen) read a paper on the advantages and disadvantages of endotracheal anaesthesia. She stated that, as a result of intubation, a perfect airway was secured which was unaffected by the mechanics of the dead space. At all times there was absolute control of the depth of anaesthesia. In procedures such as cardio-omentopexy this was of great advantage to both the patient and the surgeon. Certain sequels, however, might follow endotracheal anaesthesia. Tracheitis might result from the use of a hard tube, and this was apt to arise if the tube was left *in situ* for several hours after operation. Trauma to the nasal passages might occur and granulomata of the vocal cords were not uncommon. Dr. Milne considered that blind intubation should not be attempted if the tube could be inserted under direct vision. The former was a haphazard and the latter a precise method. The tube should be well lubricated and should be selected individually for each patient.

Dr. JOHN CHALLIS stressed the desirability of using a soft tube. He preferred blind intubation, because he thought the patient should be subjected to the least possible interference. Dr. JOHN GILLIES (Edinburgh) stated that sometimes the bore of the tube was inadequate for the patient's requirements. In replying to the points raised, Dr. J. ROSS MACKENZIE (Aberdeen) believed that intranasal intubation should be performed by the expert and not by the novice.

SECTION OF ANATOMY AND ANTHROPOLOGY

Thursday, July 27

Synovial Membrane and Articular Cartilage

In the unavoidable absence of Mr. A. G. TIMBRELL FISHER through illness, his paper on the structure and functions of synovial membrane and articular cartilage was read by Dr. G. A. G. Mitchell.

A typical synovial membrane, he said, resembled a sleeve with two surfaces and two circumferences, which to the naked eye appeared to end at the margins of the articular cartilages but microscopically could be traced for a short distance over their lateral portions. The surface of the non-villous portion was mainly composed of an endothelial-like layer of flattened connective-tissue cells, but where friction existed the surface was collagenous. The villous portion was richly supplied with rounded or oval synovial cells of connective-tissue type which secreted a fluid rich in mucin. Analysis of synovial fluid showed that total solids averaged 4.41 per cent., with protein 1.6 per cent. and mucin 1.95 per cent. This high mucin content, combined with a protein content lower than that of lymph plasma, showed that the fluid was mainly lubricant. The mode of absorption from the joint was still undecided. Isotonic solutions and diffusible dyes were absorbed rapidly and dyes of greater molecular composition more slowly. In both cases movement expedited absorption. The free surface of the central area of articular cartilage was, he continued, smooth, collagenous, and devoid of any cell covering. The surface cells were not degenerate, but were the parent cells of those lying in the intermediate and deeper layers, and were analogous to the perichondrial cells of the lateral area. Slow disintegration of surface collagen occurred, but it contributed only to a minor extent to the synovial fluid. The deeper cartilage cells were degenerate and were gradually absorbed by chondroclasts. The lateral area was covered by a delicate extension of the synovial membrane, which formed a perichondrium. In this lay capillaries from the circulus articuli vasculosus, and in the deeper layers of this area blood vessels that had penetrated the subarticular bony layer could be traced. Owing to these additional sources of nutrition the lateral area was far better nourished than the central, and the first degenerative changes were seen in the latter. The principal source of nutrition of articular cartilage was the circulus; this was supplemented by the subarticular vessels, which assisted in the nutrition of the deeper layers, and the synovial fluid, which assisted in the nutrition of the most superficial and central area. Mr. Timbrell Fisher has observed that removal of or injury to the central area in experimental animals was followed by compensatory proliferation of the better-nourished lateral area, and he maintained that marginal osteophytes in chronic arthritis were the reaction of the better-nourished lateral area to those injuries and diseases which caused degeneration of the central area.

Professor H. A. HARRIS (Cambridge) discussed the nutrition of the articular cartilage and indicated the zone in which actual mitosis of cartilage cells occurred, as shown by sections in the human joint. He attributed to the synovial membrane a purely absorptive function, and held that the mucin was formed by wear and tear of the synovial membrane. If the older notions of secretion by the synovial membrane were given up, it would then be brought into line with the peritoneal, pleural, and pericardial membranes as surfaces at which absorption took place. Professor A. Low (Aberdeen) drew attention to Ogston and Redfern's work on cartilage, which agreed closely with Professor Harris's descriptions.

Muscular Control of Joints

Mr. A. M. HENDRY (Birmingham) outlined the mechanism whereby locking of the knee at the end of extension was produced by the action of the quadriceps directly and by the vastus internus in particular. Cases were cited and arguments advanced in support of this theory and also of the view that ligaments and the shape of articular surfaces played no part in the control of normal joint movements. The

control of the skeletal parts which moved at the joints by group action of muscles was, he maintained, more important than the action of individual muscles; postural tonus in man was exhibited by the flexors and adductors at the hip, the hamstrings, and calf muscles.

Professor DAVID WATERSTON (St. Andrews) said that he had always believed that ligaments performed some function in the limitation of joint movement, and instanced the ilio-femoral ligament at the hip. Professor R. D. LOCKHART (Aberdeen) remarked that Mr. Hendry's observation that the medial vastus was most actively exercised in the last phase of extension was valuable and practical. It was salutary for anatomy that the over-estimated importance of the ligaments in controlling movements should be questioned in the light of practical experience. Mr. W. MCADAM ECCLES said that industrial accidents cost the country millions a year because of the want of properly applied exercises in the rehabilitation. Adhesions in joints were almost a myth; they occurred really in the groups of muscles acting upon joints. Ligaments had played little part in the disabilities following injuries. Professor HARRIS pointed out the importance of the primitive flexion reflex. Flexion of the upper and lower limbs involved a larger number of spinal nerves than extension. The extensors were virtually brakes on the dominant flexors. The first thoracic and third sacral nerves were involved essentially in the movements of the flexion.

Absorption of Fluids from Joint Cavity

Dr. E. W. O. ADKINS and Dr. D. V. DAVIES (both of Cambridge), in a paper on the above subject, said that removal of true solutions, colloidal solutions, and fine suspensions from the joint cavity into the subsynovial tissues occurred comparatively rapidly, the rate being proportional to the size of the particle under consideration. The mechanism of this removal was obscure, but the experiments described suggested a predominantly physical process, although an active role for the synovial cells had not been excluded. The mechanism of further removal of substances from the subsynovial tissues varied with the size of particles. Small particles—for example, true solutions—entered both capillaries and lymphatics with ease. Most were removed in the blood stream. Small colloidal particles—for example, Congo-red—entered both blood capillaries and lymphatics, but with greater difficulty. Above a certain critical size, probably in the neighbourhood of the globulin molecule, removal by both these routes ceased, with the exception of small quantities which entered lymphatic vessels but were retained in the regional lymphatic glands. Still larger particles—for example, 110 mμ and over—had no route of egress from the subsynovial tissues.

Professor HARRIS mentioned that most cases of arthritis in man and animals produced no lymphatic involvement, but the experiments reported proved that there was some degree of lymphatic involvement in experimental animals. The critical study of the routes of absorption and of the functions of the cells in the synovial fluid, the cells of the synovial membrane, and the cells in the subsynovial tissues provided a new approach to the study of arthritis. Mr. ECCLES observed that the absorption of small particles had a particular bearing on infection of joints and on the passage of minute bacterial particles.

Retroperitoneal Effusions in Renal Regions

Dr. G. A. G. MITCHELL (Aberdeen) described experiments in which radiological methods were employed to trace the spread of fluids from the perinephric and paranephric spaces, and correlated these with the anatomical findings at subsequent dissections. Several interesting points emerged, the most important being the fact that the anterior layer of perirenal fascia actually became attached to the lumbar vertebrae and intervertebral disks, and did not blend with the corresponding layer on the opposite side or with the fascia in the mesenteric root. This attachment was weakest below, so that spread of an effusion to the opposite side invariably occurred in the lower lumbar region, an event clearly demonstrated by many actual radiographs. It was shown that early spread downwards sometimes took place in the delicate peri-ureteral tissues, that in most cases there was invasion of the pelvis, and that occasionally the fluid might extend downwards in the extraperitoneal tissue around a patent processus vaginalis, or into the thigh postero-external to the femoral artery.

Professor H. A. HARRIS pointed out the importance of birth injuries to the liver, kidney, and suprarenal as a cause of death, and suggested that Dr. Mitchell should study the spread of effusion from the region of the bare area of the liver.

Dr. MITCHELL in his reply stated that the spread of effusions from the region of the bare area of the liver had been studied, and he gave a short summary of the results.

SECTION OF DISEASES OF CHILDREN

Thursday, July 27

Genito-urinary Infections

With Mr. G. G. BRUCE (vice-president) in the chair, Dr. WILFRID SHELDON opened a discussion on genito-urinary infection in children. He referred to similar discussions at two previous meetings; to the clinical descriptions given on those occasions he had little to add. At Winnipeg in 1930 speakers had suggested "pyelonephritis" as a better term for the condition often called pyelitis, and the blood-borne route of infection was also stressed on that occasion. Diagnosis consisted essentially in the discovery of pus cells in the urine; normal male children should not pass any pus cells, and in females normal counts allowed up to two cells per field with 1/6 power objective (non-catheter specimens). Dr. Sheldon then discussed aspects of aetiology, age incidence, and sex incidence—especially stressing the dominance of males in the early periods of childhood—which confirmed the theory of blood-borne infection. Symptomatology included many features, such as rigors, vomiting, restlessness, pallor, and collapse, which did not at first sight suggest a renal origin, especially in young infants. Fever in the newborn period was frequently due to urinary infection, and the diagnosis of "dehydration fever" should not be lightly made. For the treatment of acute cases Dr. Sheldon recommended alkalis as being effective and harmless. In chronic cases mandelic acid treatment was effective for *Bacillus coli* infections; whereas sulphonamide preparations were useful for other organisms. With any case of persistent infection full urological investigation was desirable.

Mr. MATTHEW WHITE (Glasgow) stressed the part played by anatomical lesions of the urinary tract in the persistence of infection. Obstruction to the free flow of urine was to be suspected in such cases, and relieved if possible. In a double series of cases investigated in Glasgow, some in medical and some in surgical wards, it was notable that renal signs and symptoms were often slight or absent, and the urinary infection was only found when routine examination was being carried out to discover the cause of obscure vomiting, for example. Gross abnormality was found in 30 per cent. of cases investigated in the medical wards, 48 per cent. in boys and 23 per cent. in girls; whereas on the surgical side, with a higher average age, the respective percentages were 41, 73, and 28. The higher figures in boys were partly accounted for by the fact that stone was commoner than in girls; eighteen out of 125 cases were found to have stone—fourteen boys and four girls. In infants the commonest lesion was some form of hydronephrosis, either mechanically produced, with a stricture somewhere in the ureter or urethra, or without gross anatomical block, in which great dilatation of ureter and kidney occurred, unilateral or bilateral, some of these children also having Hirschsprung's disease, suggesting a common neurological origin. Mr. White showed slides illustrating various types of lesions, and mentioned the usefulness of filling the bladder with a solution of sodium iodide, which would run up a patulous ureter in some instances and give a good *x*-ray picture.

Dr. A. G. OGILVIE (Newcastle-upon-Tyne), whose communication was read in his absence by Dr. I. GORDON

(Aberdeen), dealt with some of the special features of urinary infection in infancy, when it was often overlooked. The lesion was commonly a pyelonephritis, and the female sex predominance of later life was not present. Cases appeared to fall into two groups, according as to whether the urinary infection was the sole lesion or merely one manifestation of general sepsis, over one-third of cases falling into the latter group. The onset might be acute with violent vomiting, development of the "gastro-enteritis" syndrome, refusal of food, convulsions, and neck rigidity. Symptoms directly referable to the renal tract were rare. Abdominal pain of an acute type presented obvious difficulties in diagnosis, which were not helped by the fact that pus might not be present in the urine during the first two or three days. In some cases the onset was insidious, with fretfulness and wasting, drowsiness, rocking of the head, and a curious earthy tint of the skin. Treatment by sulphonamide was simple and most satisfactory. Dr. Ogilvie had found potassium citrate ineffective in infants and not well tolerated. Treatment was less effective when general sepsis was present. He made some concluding remarks on renal tuberculosis in childhood, stressing its frequent symptomless character and the relatively good state of general health, which, however, did not necessarily mean a good prognosis, since generalization with a terminal meningitis was sometimes the sequel of what had appeared to be a successful removal of a tuberculous renal lesion.

Dr. K. H. TALLERMAN opposed the view that dehydration fever in the newborn was often really due to a urinary infection. Fluid given prophylactically in the first two days of life prevented its occurrence in most infants.

Professor G. B. FLEMING (President of the Section) agreed that dehydration fever was an entity, but stressed that the concentrated urine then passed might lead to pyelitis, as also occurred in some infants with gastro-enteritis who had been treated with hypertonic saline. He thought that a number of cases of urinary infection were examples of cystitis rather than pyelonephritis, and readily cleared up. It was important in deciding about the "cure" of a chronic case to be sure that all traces of sulphonamide, for example, were absent from a specimen of urine sent for culture, as otherwise a false negative result might be obtained.

Dr. F. M. B. ALLEN (Belfast) referred to cases of urinary infection in the newborn in which a sustained rise of temperature occurred, and such cases responded well to sulphonamide. He had twice seen a baby die of *Bacillus coli* meningitis as a sequel to unrecognized urinary infection. In cases with chronic infection the general health might be remarkably good. With recurrent infection the importance of upper respiratory tract infections should be remembered, as possibly keeping up the renal trouble. Dr. JOHN CRAIG (Aberdeen) agreed that genito-urinary infection was often part of general sepsis. Blood cultures were often found to be positive in acute bowel disturbances, suggesting an aetiological factor in pyelitis. He inquired about the use of intramuscular uroselectan. Dr. A. DOYNE BELL replied that he had used this method but was very disappointed with the results.

The Physically Subnormal School Child

Dr. K. H. TALLERMAN took the chair when Dr. ERIC F. DOTT (Edinburgh) read a paper with this title. He expressed his interest in the type of child seen in out-patient work and in private practice who was not very robust and with many minor ailments. The common factor to a group of seventy of such children appeared to be body tissues which were too easily fatigued and remained so for years. Such children showed a general proneness to fatigue, mental and physical, with low body weight, slight build, cardiovascular disturbances (pallor, poor peripheral circulation), recurrent headaches and sick turns, poor posture, limb pains, anorexia, chronic indigestion, and often educational difficulties, with irritability and emotional instability. Dr. Dott especially dealt with the management of such children, stressing that it must be prolonged and broad in scope. Supervision over several years, with an efficient follow-up system, was essential. Rest, physical and mental, with subdivision of all mental and physical activity into short periods, was most important. Diet required correction in many cases, but it was interesting that symptoms of indigestion often disappeared when sufficient rest was obtained. The psychological management of these children was very important, and the whole atmosphere around the child must be healthy and confident. Results showed that in not less than six months 80 per cent. of the children were improved and 30 per cent. very much improved. Very noticeable was the increased cheerfulness and confidence of the children themselves. The educational authorities also noted a great improvement in educational ability.

Dr. J. B. JESSIMAN (Malvern) thought that the cases described of so-called debility in childhood resulted from two main causes—toxaemia (tonsillar infection and tuberculosis) and deficiency diseases. He thought such children would often not improve until a septic focus was removed. The high incidence of rickets in such cases suggested failure on the part of the public health authorities.

Psychotherapy

Dr. ETHEL DUKES read a paper on the relationship between children's medicine and psychotherapy, in which she traced the development of psychology as applied to disorders in childhood and stressed the importance of considering the patient as "the whole child." It was not yet readily accepted that many of the physiological complaints or organic diseases for which a child was brought to a paediatrician might be the end-result of a psychic conflict, or that disease might become chronic because of an accompanying neurosis. Dr. Dukes then discussed the probable mechanism by which the final state of organic disorder was reached, through the endocrine glands and the autonomic nervous system. In assessing factors of causation it was valuable to ask certain questions: What was the child like before he became ill? Why did he fall ill when he did? Why did he fall ill in the way he did? Treatment had to be planned on a broad basis, which might have to include surgery as well as re-education not only of the child in mind and body but also of the parents. Some form of analysis and treatment through play was often the best method of approach. The family doctor had a most important part to play, as he was likely to be acquainted with the whole environment of the child, and increased facilities for the psychological training of medical students were most important. The paediatrician must also be trained in the psychological approach to disease, and equally the child-psychiatrist should have experience of general medicine, children's medicine, and normal children. Dr. MARGARET LOWENFELD pointed out the present danger of letting psychological treatment of problem children pass into the hands of the educational psychologists, who had no medical training, merely because in many areas paediatricians were unable to help.

SECTION OF PATHOLOGY AND BACTERIOLOGY

Thursday, July 27

Enlargements of Lymph Nodes

With the president, Professor JOHN CRUICKSHANK (Aberdeen), in the chair, Dr. JOAN M. ROSS opened a discussion on non-infective enlargements of lymph nodes. She based her classification upon the cytology of the lymph gland as described by Maximow. The mesenchymal cells, which formed an undifferentiated syncytium in association with the reticular framework, were capable, given a suitable stimulus, of differentiating into fibrocytes, tissue histiocytes, littoral cells, reticulum cells, lymphoblasts, and haemocytoblasts. In the non-infective enlargements of the lymph nodes proliferation of one or more of these cell types gave rise to different kinds of reticulosis. These might thus be classified in the following way. (1) Medullary reticulosis, in which there was a proliferation of the undifferentiated mesenchymal cells in the medullary tissue or pulp of the lymph nodes, spleen, periportal tissues of the liver, and possibly in the connective tissues of the body. Included in the group of primary medullary reticuloses were the haemic forms or leukaemias, the histiocytic and the

fibromyeloid reticulosis or Hodgkin's lymphadenoma. Dr. Ross included, as a separate category of the medullary reticuloses, the generalized metabolic lipoidoses such as Gaucher's and Niemann-Pick's disease. (2) In the follicular reticuloses there was a hyperplasia of the undifferentiated cells in the lymph follicles and Malpighian bodies of the spleen, together with the production of a follicular structure in the bone marrow and periportal tissue. These conditions generally arose in adults, and the enlarged nodes were markedly radiosensitive. (3) In the sinus reticuloses there was a hyperplasia of the littoral cells in the lymph sinuses, liver sinusoids, and in the venous sinuses of the spleen and bone marrow. The clinical aspects of this group were ill defined.

Dr. A. H. T. ROBB-SMITH (Oxford) summarized the historical developments in the classification of the blastomata of the lymph glands. He stressed the fact that the blastomata caused destruction of stroma as well as infiltration—a point which distinguished them from the reticuloses. Spontaneous reticulo-sarcomata had been described in various animals, and reticulo-sarcomata had also been induced in association with leukotic conditions of mammals and fowls by means of carcinogenic hydrocarbons and thorotrast. In human subjects most instances of reticulo-sarcoma occurred in the fifth and sixth decades, more rarely in young adults. Dr. Robb-Smith subdivided these cases into (1) those with a primary lesion in an area of lympho-reticular tissue with secondary involvement of regional lymph nodes and subsequent metastases to distant organs; (2) those in which a reticulo-sarcoma arose in association with a pre-existing reticulosis; and (3) those which showed a generalized reticulo-sarcomatosis analogous to the classical lymphosarcomatosis of Kundrat. He appealed for the centralization of information about the primary lymphadenopathies on the lines of the American Bone Sarcoma Registry.

Dr. W. B. DAVIS (Blackpool) said he had found Gordon's biological test to be positive in twenty-one out of thirty cases of Hodgkin's disease; the Friedmann test had proved more sensitive, being positive in twenty-nine out of thirty-two cases and negative in fifty-five control cases. Parallel application of the two tests in twenty-five cases of Hodgkin's disease showed Gordon's test to be positive in seventeen and the Friedmann in twenty-three cases. His experience in thirty-six cases of Hodgkin's disease and fifty-eight control cases did not support the view that the biological activity ran parallel with the eosinophil content of the lymph nodes, nor was this true of specimens of pus which yielded biologically active Friedmann extracts. On the other hand, van Rooyen's view that the biological activity of lymph nodes was a function of the reticulum cells could not be universally maintained, but there was evidence to suggest that it might well be true for one phase of differentiation of reticulum cells. Should this prove correct the biological test might serve to identify one particular reticulum cell or cell group which could not be differentiated histologically, and the biological properties of such a cell would be of importance in the classification of reticulosis.

Dr. C. E. VAN ROOYEN (Edinburgh) endorsed the last speaker's remarks. He had found the Friedmann test superior to the Gordon test in delicacy and usefulness. Although the virus theory of Hodgkin's disease had been discounted, our rapidly changing conceptions of the nature of viruses demanded a cautious approach to this aetiological problem. We still did not know whether the encephalitogenic agent in the lymph gland in Hodgkin's disease represented the cause or an effect of the disease. Attempts to correlate the biological effect in Gordon's test with the histological components of the tissue had proved inconclusive. He concluded that the agent was contained in the reticulum cells, although, as pointed out by Dr. Robb-Smith, not in all reticulum cells. The morphological similarity of cells, however, did not imply their biological identity.

Glomangioma

An occasional paper on "Painful Subcutaneous Tubercles—the Glomangioma" was read by Dr. A. C. LENDRUM (Glasgow) and Mr. W. A. MACKEY (Glasgow). Dr. Lendrum said that these tumours were less rare than was commonly supposed. He demonstrated the relation of the tumour to the normal vascular structure of the glomus. Examples were commoner in women than in men, and in seventeen of the thirty cases recorded in women the tumour was subungual. Severe pain was a prominent symptom, and might precede the manifestation of the tumour by years. Sympathetic disturbances had also been recorded.

Sterilization of Dressings

Dr. R. J. V. PULVERTAFT (Chislehurst Common), in a paper on the sterilization of dressings and surgical appliances, disclosed the danger from spore-bearing anaerobes in supposedly sterile dressings. Failure to effect sterilization lay in the over-tight packing of drums and in the ineffective temperatures reached in the autoclave. The supervision of sterilizing processes in hospitals was usually inadequate. He produced evidence that rubber gloves, talc powder, and gauze masks might be further sources of danger. The sterilization of air in operating theatres had been greatly neglected; tests had shown that the air became contaminated by bacteria during operations, especially in infective cases. Professor C. H. BROWNING and Professor J. CRUICKSHANK both encouraged Dr. Pulvertaft to disclose as fully as possible the unsatisfactory features of what had become, in most places, a ritual. In reply Dr. Pulvertaft said that the mechanics of the autoclave had been neglected, and that greater supervision by bacteriologists should be demanded in all centres.

MEDICAL SOCIOLOGY (NUTRITION)

Thursday, July 27

Food Conservation and National Supplies

With Sir JOHN BOYD ORR in the chair, Sir JOSEPH BARCROFT opened a discussion on food conservation in relation to the national food supply. Sir Joseph Barcroft's paper is published in this issue at page 324.

The Preservation of Fish

Dr. G. A. REAY (Torry Research Station, Aberdeen) said that fish was a highly perishable foodstuff and did not improve, as meat or game did, on hanging. The agents of spoilage were marine bacteria. Even under the best conditions of handling and stowage, gutted white fish would not keep fresh in crushed ice for longer than ten to twelve days. In the case of herring stowed without gutting according to custom, the limit was four to six days. Smoked fish, such as "finnans" and kippers, kept satisfactorily for no longer than one week at ordinary temperatures, and for no longer than two weeks at 0° C. (32° F.). The bulk of the national supply of fish was normally stored for no longer than such short periods. Both white and fatty fish, however, could be held in excellent condition for a season—that is, for anything from two months to a year—by proper freezing and cold storage. Herrings remained in first-class condition for six months if rapidly frozen, well glazed, and stored at −30° C. (−22° F.). After this rancidity of the fat gradually developed. White fish similarly treated remained in excellent condition for a year or more. Certain species—for example, lemon sole—had been found to be highly palatable after four years. Smoked fish had been successfully stored at −30° C. for four months in the case of kippers and for six months in the case of smoked white fish. Fish could be successfully preserved for a season by canning. Both wet and dry salted fish kept in good condition with certainty for a season if a chill temperature was used—say, 0° C. to −3° C. (32° F. to 26.6° F.). As to whether fish could be kept in any instance for long periods—say, for ten years—little reliable data were available. Possibly white fish, but not fatty fish, would store well for a good part of this time at −30° C. Certain oily packs of canned fish were said to have been successfully preserved for ten years. Hard, dried, salted fish would probably keep at 0° C. in good condition for several years

if suitably packed in airtight containers. Freezing and cold storage properly applied was preferable to all other methods of preserving fish, as it altered the nature of the fish's flesh least, thus coming nearest to ideal preservation.

Storage of Fruit and Vegetables

Dr. F. KIDD (Low Temperature Research Station, Cambridge) said that the supply of green vegetables was based on a rotation of crops, and home-grown vegetables could be cultivated to supply 70 or 80 per cent. of national needs. As for fruits, the banana and orange came from abroad, but their storage was limited to the period of transport, as it was possible to draw supplies from places where these fruits were in season throughout the year. For the storage of fruits and vegetables for long periods three methods were employed —namely, freezing, canning, and drying. The limiting factor in the storage of canned goods was the deterioration of the can due to corrosion by the contents. In cans lacquered by up-to-date methods varieties of fruits could be stored for from four to six years and vegetables for ten years. The increase in tin content did not attain serious proportions. Holding the can at low temperatures increased the storage life. Freezing and holding at low temperatures often gave a product superior in palatability and appearance to the canned product. Blanching and rapid freezing were usually necessary. At a temperature of −20° C. to −25° C. (−4° F. to −13° F.) hydrolytic changes were negligible, while exclusion of oxygen and blanching assisted in preservation of vitamin C. Drying generally resulted in loss of vitamin C and other undesirable changes. Low-temperature drying produced dried products that retained their native properties to a greater extent. Dried products had the advantage of being light and easily transported, and changes during storage could be reduced by lowering the water content and excluding oxygen. He concluded by saying that almost all kinds of fruits and vegetables could be stored for up to two years by the methods at present in use, with complete retention of the nutritive value of the foodstuff. They could be stored for a considerably longer period by applying precautions based on known principles. Failure in canning was due not so much to failure in the contents of the can as to failure of the can itself.

Nutritive Value of Canned Foods

Mr. W. J. GODDEN (Rowett Research Institute, Aberdeen) said that canned foods, particularly fruit and vegetables, had an important advantage for the dietary of the nation for various reasons. They permitted of the utilization of the glut of fruit and vegetables produced in the summer months, and the more even distribution and utilization of such crops over the year. They rendered available at a reasonable price a varied supply of fruits and vegetables at seasons of the year when the fresh article either could not be obtained or could be obtained only at an exorbitant price. It was of prime importance to have reliable information as to the nutritive value of canned foods and the effects, if any, which the processes of canning and storage were likely to have on the nutritive value of the foodstuffs. Mr. Godden proceeded to describe a long-period feeding trial with rats in which he had compared the nutritive value of a diet comprised solely of foods canned in Great Britain with that of a diet of similar foods purchased at shops or grown locally and cooked as the housewife cooked them. The experiment was started in March, 1936, when two groups of rats were taken, one group receiving a diet consisting entirely of canned foods and the other of foods as ordinarily cooked. The original animals when they attained maturity were allowed to breed and the growth curves of their progeny were followed, complete records being kept of breeding data, weight increase from birth to weaning, mortality at birth and to weaning, over three generations, and for seven successive matings in one generation. Weekly weighings were also taken, and as a further check certain representative rats after a given period were killed and determinations made on the entire carcass of dry matter, total ash, and calcium and phosphorus; the bones and teeth were also analysed for ash and calcium and phosphorus content. The experiment lasted about eighteen months, during which time some 1,700 rats were used in four successive generations. Half the rats on canned food consumed some 8,000 cans, corresponding to about three and a half tons of canned foods, plus 800 pints of evaporated milk. The canned foods used were beef brisket, tongue, herrings, cabbage, beetroot, carrots, and several other vegetables, apples and other fruits, bread, milk, and syrup. An examination of the breeding and growth data revealed no significant or consistent difference between the two groups with respect to size of litters, average weight at birth and at weaning, mortality at birth, or from birth to weaning, or in the growth rate of each successive generation from weaning to 119 days. There was also no indication of any falling off in the performance of the animals either in successive litters of the second generation or in successive generations. These results were in complete agreement with those of Matcheboeuf, Cheftel, and Thiullot, using foods canned in France, who carried on rats under a similar regime through nine generations, and of Kohman and his co-workers, who, using foods canned in America, carried rats through ten. The analysis showed slight differences in favour of the fresh foods in respect of percentage of ash in the dry matter and in percentage of calcium in the ash, but *x*-ray photographs gave no indication of faulty calcification, and subsequent analyses of bones and teeth of other animals showed no significant differences in these respects. The rat as an experimental animal was not susceptible to a deficiency of vitamin C, and hence would not show whether any destruction of this factor had occurred during canning and storage. Detailed study of this aspect of the problem had been made at Cambridge by Miss Olliver, using the chemical method for the estimation of this vitamin, and she concluded that the destruction of vitamin C consequent on canning of fruit and vegetables was small and likely to be much less than that caused by shop storage of fresh foods and their subsequent household cooking. It appeared, therefore, that canned foods formed a useful and reliable adjunct to the human dietary and might be used with perfect confidence from the nutritional point of view.

Conservation of Milk

Dr. H. D. KAY (National Institute for Research in Dairying, Reading) said that, given a sufficiency of calories, roughage, and iron (and possibly iodine, copper, manganese) in the diet, a pint of milk a day in addition would in practice ensure effective nutrition in almost any human being. In times of emergency, when the diet was much more likely to be restricted than in times of peace, this fact was doubly important. But it was doubtful whether a sufficient liquid milk supply could be steadily maintained in times of war. How far, then, could preserved milk be depended on to meet the need for a supplement of animal protein, calcium, phosphorus, and other minerals, easily digested fat, and vitamins A and B_1 and lactoflavin to a diet which might be largely composed of rather inferior cereals with uncertain quantities of vegetables, tinned fruit, and tinned meat? Methods of conserving milk had greatly improved during the past twenty years. The principle was, of course, the removal to a less or greater extent of the 87 per cent. of water present in fresh milk, and the preservation of the concentrated or dried product from further deterioration by sterilization (evaporated milk), by adding cane sugar (sweetened condensed milk), or by drying as thoroughly as possible and keeping in an airtight tin *in vacuo*, or in an inert gas (roller- or spray-dried milk). In this country it was fortunate that these products were usually prepared in largest bulk in the spring and early summer, when the quantity of milk, from cows fed on rich spring grass and exposed to sunshine, was at its best. The milk at that season of the year contained considerably more vitamin A, lactoflavin, and vitamin D than did winter milk even from the same cows. Very recent work at Shinfield had shown that the nutritive changes produced in milk by modern methods of spray and roller drying were relatively small. There was some 20 to 30 per cent. loss of vitamin C and a slight loss of vitamin B_1, but practically no other nutritionally significant change. Evaporated milk suffered loss of rather more vitamin C, and 50 per cent. or more of its vitamin B_1, but little other change. When stored in an

inert gas, dried milk preserved its flavour for eighteen months or more, but lost a little more vitamin B_1. In any food defence policy the extensive storage of preserved milk, preferably spray-dried milk, packed in inert gas in sealed tins (which could be kept at ordinary temperatures for at least eighteen months without changes in flavour or serious change in food value), commended itself as the wisest complementary step to the storage of wheat or other mainly carbohydrate foods. The addition of two and a half ounces of spray-dried evaporated milk per day would render a relatively poor diet good to the same extent as a pint of raw milk.

Dr. H. E. MAGEE (Ministry of Health) said that the speakers had shown that canning and preservation did not produce anything in the nature of changes that could be regarded as significant from a nutritional point of view. The time was now opportune for a knowledge of this subject to be spread fairly widely, the more so because there existed in the minds of many of the public a considerable amount of prejudice with regard to the nutritive value of canned foods. He hoped that the papers which had been read might eventually be issued together in a volume.

Sir JOHN ORR, in summing up the discussion, said that the work which had been described had a greater value than in its mere relation to the immediate problem of storing against a national emergency. These methods when put into force would save a great wastage of food which took place at the present time. Moreover, the adequate storing of these foodstuffs would make it possible to regulate supplies, instead of having a glut at one period of the year and great scarcity with high prices at another. The highly important foodstuffs which had been dealt with during the discussion could thus be kept in more or less constant supply throughout the year, and the price would then not be unduly high in the winter, when more food of this kind was needed. That result in itself would increase the consumption of nutritive foods.

SECTION OF NEUROLOGY AND PSYCHIATRY

Thursday, July 27

Visual and Auditory Hallucinations

The second session was occupied with a discussion on the significance of visual and auditory hallucinations. Dr. R. DODS-BROWN (Aberdeen), vice-president, occupied the chair during the reading of the opening papers, and Dr. C. P. SYMONDS, president, during the discussion.

Dr. P. K. MCCOWAN (Dumfries) said that isolated hallucinations existed in the sane, apart from eidetic images and hypnagogic hallucinations. Byron, Luther, and Joan of Arc, and certain religious ecstatics, poets, and philosophers, had had hallucinatory experiences. Some of them had frank psychotic episodes. Among primitive races such experiences were commoner than at the present day. This could be correlated with a regression in the type of thinking from present-day abstract thinking to clairvoyance and thought-pictures. He cited cases illustrating how the words used by patients in describing visual and auditory hallucinations might be an inadequate attempt to put into language some abnormal experience that could not be conveyed adequately by speech. Patients might be aware of the unreality of their hallucinations, and could differentiate between their ordinary thoughts and those occasioned by their "voices."

Dr. MACDONALD CRITCHLEY said that hallucinations might be associated with local brain lesions, such as tumours, vascular lesions, and injuries, as well as with various diffuse toxic conditions, such as febrile states, drug addiction, inanition, fatigue, and hypoglycaemia. Cases of brain tumour might exhibit (1) "thought-hearing," as in a case of temporal tumour where the patient could hear his thoughts being repeated by others; (2) "optic allaesthesia," where actual objects in the patient's visual field appeared to the subject to be dislocated in space, and even inverted (this might occur also in migraine); (3) peduncular hallucinosis, which was seen in lesions of the posterior hypothalamus or in suprapituitary tumours. The visual hallucinations might be lilliputian. In reflex epilepsy, mimicking the patient's visual or auditory aura would induce a fit. The teichopsia of migraine was a hallucinatory phenomenon; auditory hallucinations, however, did not occur in true migraine. In narcolepsy disorders of nocturnal sleep were so common as to constitute a third characteristic symptom of the disorder. Dr. Critchley concluded his paper by referring to hallucinations in drug intoxications, differentiating between the effects produced by a simple massive dose and by chronic intoxication.

Professor HUGH CAIRNS (Oxford) gave an account of hallucinations occurring in 100 patients in a series of 800 verified cases of intracranial tumour. He said that patients would suppress the story of their hallucinations from self-consciousness unless they were directly questioned about them. Visual hallucinations were more frequent with tumours of the right cerebral hemisphere, and their recording might be interfered with by aphasia or amnesia in the patient. In many cases they ceased after removal of the growth. Visual hallucinations in his cases were paroxysmal, often a prelude to a general motor discharge, and they sometimes resembled visual images which could be produced experimentally by stimulating areas 17, 18, and 19 of the human occipital cortex. In ten cases the tumour was in the occipital lobe, and in these visual hallucinations of hemianopic distribution might be an early or first symptom. Flashes of light or the presence of a shadow in the visual field might be encountered. In eleven cases the growth was in the parietal region, and in these cases simple visual hallucinations occurred, followed by a sensorimotor epileptic discharge. In twenty-one cases of temporal tumour the hallucinations were more complex and were associated with a variety of other sensory impressions. In sixteen cases of frontal tumour visual hallucinations occurred not differing in character or clearness from those in lesions of other parts of the brain. Olfactory or other sensory accompaniments were absent in cases of frontal tumour, and the hallucinations were not so paroxysmal as with tumours elsewhere. In pituitary and suprapituitary tumours the hallucinations could not be linked with defects in the visual pathways. They were accompanied by a variety of gustatory, olfactory, and viscero-sensory sensations. Hallucinations might occur as a complication of ventriculography and as a post-operative complication in tumour cases. They were commoner with meningiomata than with gliomata, and were most acute from twelve to twenty-four hours after operation, disappearing completely in three to five days. He concluded that visual hallucinations might occur with tumours of any part of the cerebral cortex, optic thalamus, or optic chiasma. They were related to the phenomena of migraine and the psychoses. His findings indicated the presence of a wide system of neurones, stimulation of any part of which might set up hallucinations.

Dr. W. S. MACLAY said that knowledge of hallucinations had depended mainly on verbal descriptions by patients of their experiences. Such description was not always satisfactory, and could contain fallacies. Graphic representation provided additional information which was reliable and more objective. In previous work on the drawings of schizophrenic patients it was found that the scope of the investigation was apt to be limited by the patient's ability to draw. Some artists were found who volunteered to take enough mescaline to cause hallucinations. They then made sketches during and after the intoxication. A series of pictures was presented showing various phenomena of mescaline hallucinations—for example, typical patterns, ability to see structures at the back of the eye, photopsia, repetitive appearance of the visual phenomena, wave-like distortion of vision, and the tendency of things to elongate themselves in whatever direction the attention was turned to. In this series the elaboration which changed elementary sensations into hallucinations could be demonstrated. In the early pictures the phenomena (for example, repetition) could be explained in purely physiological terms, but in the later ones more and more additional features appeared which could only be accounted for in psychological terms. The comprehensible contents were, in fact, superimposed on the physiological phenomena, which interfered with the definition of the visual perceptions. Both physiological and psychological considerations had to be taken into account.

Dr. G. W. B. JAMES illustrated the tendency to regressive types of thought-pictures and primitive feeling by reference to the ever-growing popularity of the cinema, and the productions of certain "schools" of art and "modern" music. He had observed personally six cases of lilliputian hallucinations. They occurred, in his experience, in three groups of cases: (1) alcoholics, (2) elderly persons with senile symptoms, and (3) cases of Bright's disease. Dr. E. J. C. HEWITT (Shenley) referred to the hallucinations produced by bromide intoxication, and pointed out the importance of estimating the blood bromide content in cases in which the drug was being administered continuously. Dr. K. W. TODD (Gold Coast) asked what was the normal function to which hallucinosis corresponded. Was it telepathy or was it intuition? Constructive intuitions took a hallucinatory form in cases like that of John Bunyan. The only study he knew on this subject was by Dr. Assagioli of Rome. Assagioli claimed that "mental abnormalities of spiritual growth" differed from schizoid states largely by their excellent prognosis. They were conflicts on a level other than what he called Freudian or Adlerian conflicts. There was a discipline in them which ensured progress to a high level of normal life.

Dr. RICHARD EAGER (Exeter) said he was particularly interested in the inverted visions referred to by Dr. Critchley, as he had under his care about twelve to fourteen years ago a pronounced case. This was an epileptic female 35 years of age. She was admitted to hospital, and it was soon found that she saw everything upside down. When shown a pen with the point upwards she would say that it was pointing downwards; she wrote backwards, and when asked to spell such words as "hippopotamus" would spell them as quickly backwards as the ordinary person would do the right way. She submitted to hypnosis and the condition cleared up. Dr. DAVID BLAIR (Edinburgh) spoke of the difficulty of dealing with some cases hallucinated in the course of an interest in spiritualism or after an extreme emotional experience—for example, after committing murder. He also referred to hallucinations following ear disease terminating in insanity, and of hallucinations following pituitary tumours (acromegaly) and terminating in insanity. Dr. D. ROSS (Lochgilphead) mentioned four cases in which the emotion accompanying lilliputian hallucinations was one of horror, not of pleasure, and the patients became in consequence suicidal. He mentioned a case under treatment by cardiazol in which there was no amnesia and in which an injection was followed by an acute hallucination of a band playing "God Save the King." This was the prelude to a change in the patient's delusional system, which was of a political nature, with subsequent improvement.

Dr. REDVERS IRONSIDE said that visual hallucinations of hemianopic distribution were commonly associated with gross intracranial changes, whereas visions of more global distribution were not so commonly associated with gross intracranial lesions. Hemianopic visions were met with in a variety of lesions of the temporo-sphenoidal and occipital lobes, and apart from their distribution had other striking characteristics: (1) they were usually though not invariably recognized as illusory by the patient; (2) they were described as brightly coloured, even luminous, the colour often impressing the patient more than the outline; (3) they were most commonly in a state of movement; (4) they moved in series, in geometric designs or arabesques; and (5) the bizarre quality was seldom lacking. Grimacing, deformity, and lilliputian forms occurred when the visions were animate objects. Visual hallucinations of more global distribution occurred typically in toxic states, and only rarely in association with gross intracranial lesions. They might be met with in intracranial tumours in almost all localities, in the absence of increased intracranial pressure, and might be accompanied by disorientation and mental confusion or might occur alone. It was doubtful if they were commoner in brain disease than in cardiac or pulmonary disease. Lhermitte, Van Bogaert, and others had described such visual hallucinations in tumours of the floor of the third ventricle and posterior part of the hypothalamus. This was a part of the brain which almost certainly had to do with sleep mechanism. According to Lhermitte, sleep had a negative component—suspension of consciousness—and a positive component—dreaming. He regarded the hallucinations met with in tumours of this area as a dissociation of the sleep process, and described them as having the character of waking dreams. It was noteworthy that they tended to occur most clearly as the hour of sleep approached.

Dr. D. R. MACCALMAN (Aberdeen) said that a type of disease producing hallucination which had not been mentioned was cardiac disorder. Here the hallucinations took the form of large furry animals floating in the air or terrifying scenes of murder. He was interested in tinnitus of an unpleasant nature because of the difficulty of treatment. Professor CAIRNS said that cutting the optic tracts cured unpleasant visual experiences, but cutting the eighth nerve made no difference to unpleasant head noises. In senile cases tinnitus was usually a stage of degeneration, and Dr. R. G. GORDON suggested that the patient might be hurried through this stage by the administration of benzedrine. The defensive nature of hallucinations had not been emphasized, and yet it was most important in psychiatry. Dr. McCowan's case illustrated this well, for clearly the hallucinations kept her from thinking unpleasant things. Did good insight in patients who showed no neurological signs, he asked, indicate the presence of organic brain disorder? Professor Cairns's account of the hallucinations associated with tumour suggested that they were of a different nature from hallucinations in psychotic states. This should prove most useful in differential diagnosis.

SECTION OF PHYSIOLOGY AND BIOCHEMISTRY

Thursday, July 27

Chloride Metabolism

With the president, Professor E. D. ADRIAN (Cambridge), in the chair, Dr. A. LYALL (Aberdeen) opened a discussion on the pathology of chloride metabolism. After some preliminary observations on the normal intake and loss of sodium chloride, Dr. Lyall went on to discuss the normal exchanges of chloride in the alimentary canal, showing that 50 to 60 grammes daily were secreted and reabsorbed from the intestinal lumen without producing much change in the electrolyte pattern of the blood. In pathological conditions up to 30 grammes of chloride daily could be lost in the gastric and 10 grammes in the biliary secretion. Regulation of the normal chloride of the blood plasma and body fluids depended on adequate intake, prevention of excessive loss, and on the renal threshold for sodium chloride. He placed the threshold at 520 mg. per 100 c.cm. of plasma. Changes in the blood chemistry in different types of hypochloraemia were illustrated, especially by experiments in man showing the maintenance of the normal chloride concentration in the gastric secretion even with a marked fall of plasma chloride. In Addison's disease a fall of blood chloride was associated with failure of the kidney to retain chloride. Tests based upon the observation that in Addison's disease high rates of urinary chloride excretion were associated with normal or subnormal plasma chloride levels gave valuable diagnostic data.

These observations were supplemented by the evidence presented by Mr. M. A. FALCONER (Oxford), relating principally to the changes in the serum bases associated with hypochloraemia. Wherever there was marked chloride loss, as in prolonged vomiting, diarrhoea, etc., the chlorine ion was not the only one affected. In cases of high intestinal obstruction, for example, there was a fall in sodium, potassium, and calcium, the fall often being most marked in respect of potassium. He showed that where the loss of chloride was compensated by the parenteral injection of saline the serum chloride and sodium were restored to normal without any significant change in the serum potassium. The level of chloride and of the serum bases paralleled the clinical condition of the patient, depressed values for calcium and potassium being associated with increasing severity of symptoms. In the treatment of hypochloraemia saline solutions

containing calcium and potassium should be given in preference to saline alone.

Dr. W. N. LEAK (Winsford) thought some interesting information might be derived from the study of chloride metabolism in those engaged in the salt industry who worked in an atmosphere of salt dust. Replying to this and other observations, Dr. LYALL agreed with Mr. Falconer as to the value of the study of the serum bases, while pointing out the much greater technical difficulties involved as compared with chloride determinations.

Anterior Pituitary and Carbohydrate Metabolism

Dr. F. G. YOUNG then opened the discussion on the relation between the anterior lobe of the pituitary gland and carbohydrate metabolism. Removal of the pituitary, he said, increased the sensitivity of normal animals to insulin, and diminished the diabetic condition of depancreatized animals. Extracts of the anterior pituitary induced the symptoms of diabetes in normal, and intensified the diabetic condition of hypophysectomized-depancreatized animals. The assumption was that the diabetic condition of the depancreatized animal was brought to normal intensity under the influence of the secretions of the anterior lobe. A normal dog treated by daily injections of the diabetogenic extract of the anterior pituitary first displayed a latent period of insensitivity to insulin, although hyperglycaemia was not present. Later, a phase of temporary diabetes developed, leading to one of permanent diabetes with more intense treatment, or to a phase of refractoriness to the diabetogenic action of the extract if treatment was not so intense. This refractoriness might be due to functional hypertrophy of the pancreatic islets. The permanent diabetes was associated with lesions of the islets. No obvious insulin-insensitivity was found. A possible connexion with human diabetes was indicated in so far as a short phase of pituitary activity might result in lesions of the islets and permanent diabetes.

Dr. C. H. GRAY dealt with the subject of ketosis. He reviewed the conditions under which it occurred, discussed the possible modes of formation of ketone bodies, and examined the evidence for the possible identity of the ketogenic factor and the fatty-liver-producing factor in the anterior pituitary. As yet no clear-cut separation could be made between the two. Attempts at fractionation were described. Sufficient progress had not yet been made to establish the existence of a separate ketogenic hormone. In concluding his remarks, Dr. Gray considered the possible mechanism of production of the ketone bodies in response to the ketogenic factor.

Two clinical types of diabetes were differentiated by Dr. W. J. GRIFFITHS: (1) the patient, usually young, with polyuria, thirst, and loss of weight, who tended to show marked ketonuria, and was liable to pass into diabetic coma with little warning; and (2) the more elderly obese patient with no marked symptoms and no appreciable ketosis. With Professor de Wesselow, Dr. Griffiths had studied the effect of the plasma from both types on the insulin-depression curve in the rabbit. No effect was observed in the first group, but in a certain number of patients of the second type the blood-sugar depression was diminished. This pointed to the possibility of there being an anterior pituitary-like substance in the plasma of those elderly diabetics. In acromegaly, and in Cushing's syndrome, there was present in the plasma a factor resistant to the peripheral action of insulin, as was indicated by diminished or absent arteriovenous sugar differences. Deep *x*-ray therapy to the pituitary restored the peripheral sensitivity. It was assumed that in cases of acromegaly and Cushing's syndrome the disturbance in carbohydrate metabolism was somewhat analogous to that produced in animals by the injection of anterior pituitary extract.

Professor H. P. HIMSWORTH also referred to the two clinical types of diabetes differing in their sensitivity to insulin. The insulin–glucose test gave similar responses in animals treated with anterior pituitary extract and in the insensitive type of human diabetic. Acromegalics and cases of Cushing's syndrome with diabetes were insulin-insensitive. In work done with Dr. R. B. Kerr he had failed to detect anterior-pituitary-like factors in the blood either of animals rendered diabetic by pituitary extract, or of diabetic patients or of those with Cushing's syndrome. Traces of such factors had been found in the urine of acromegalics, in cases of Cushing's syndrome, and in the urine of animals treated with pituitary extracts. There was as yet, he concluded, no proof that the pituitary played a part in ordinary diabetes.

Investigations into the metabolism of the pituitary-diabetic dog as compared with that of the depancreatized animal were described by Mr. H. P. MARKS. They were alike in some respects. On a meat diet, polyuria, ketonuria, and glycosuria appeared. With a high carbohydrate diet only the preformed carbohydrate of the diet was excreted, while on a fat diet the glycosuria and ketonuria disappeared. The addition of casein to the fat diet caused a reappearance of glycosuria, but only when meat was added did the ketonuria reappear. In contrast to the depancreatized dog, the pituitary-diabetic dog might be kept for long periods without insulin, yet many required more insulin to render the urine sugar-free. The diabetic condition in the pituitary-diabetic dog was regarded as mainly due to insulin deficiency.

Dr. W. D'A. MAYCOCK said there was now conclusive evidence of the fractional connexion between the nervous system and the posterior pituitary, but only suggestive evidence of functional control by the anterior lobe. Fibres reached the anterior lobe from the sympathetic nerve plexus on the carotid artery, and probably also from the supra-optic-hypophysial bundle of the hypothalamus; stimulation of the sympathetic supply to the anterior pituitary had not been satisfactorily shown to exert any effect upon carbohydrate metabolism. Lesions in the anterior part of the hypothalamus produced effects closely resembling those of hypophysectomy on carbohydrate metabolism—results that might be explained as: (1) the destruction in the hypothalamus of centres which controlled the activity of the anterior pituitary, or (2) the destruction of centres in the hypothalamus through which the anterior pituitary exerted its effect.

Dr. J. C. EATON (Glasgow) drew attention to the results of an examination of the condition of the islets in diabetes, from which it appeared that in young subjects these tended to be normal or hypertrophied, while they showed degeneration in the more elderly subjects. He believed that there were possibly more cases of diabetes of hypophysial origin than had been suspected. Dr. H. W. KOSTERLITZ (Aberdeen) spoke first of the relation of diet to the production of ketonuria in respect of dogs rendered diabetic, and also drew attention to the possibility of insulin treatment altering the metabolism of the pituitary-diabetic dog. Dr. YOUNG, in winding up the discussion, pointed out that in respect of general dehydration there might be significant differences between the depancreatized and the pituitary-diabetic dog, and also mentioned the difficulty at the present time of correlating the results of experiments on dogs and rabbits with clinical findings.

SECTION OF OTO-RHINO-LARYNGOLOGY

Thursday, July 27

Sinusitis in Children

With the president, Mr. H. BELL TAWSE (Nottingham) in the chair, a discussion on nasal sinusitis in children was opened by Dr. DOUGLAS GUTHRIE (Edinburgh). He emphasized that otolaryngology of childhood presented special problems. The importance of sinusitis had only recently been recognized. Maxillary antrum and ethmoidal cells were most frequently involved; frontal and sphenoidal sinuses relatively rarely. The anatomy and development of the nasal sinuses were discussed with the aid of lantern slides. There was, he asserted, a surprising frequency of sinusitis as revealed by routine clinical examination or at

necropsy. Nasal discharge, usually post-nasal, was the commonest symptom. The importance of handkerchief drill, the association of sinusitis with tonsil and adenoid disease, and allergy in relation to sinusitis were discussed. Acute ethmoiditis was considered separately, the value of conservative treatment being stressed. The use and scope of radiography were assessed. Treatment should include general measures—climatic, dietetic, and medicinal. Local treatment should aim at drainage and decongestion by suction, argyrol tampons, etc. The use and abuse of nasal drops and the utility of short-wave diathermy were discussed. The technique of puncture and lavage was described and the method evaluated. Operation was seldom necessary; but, if it were, should be of radical rather than intranasal type. An answer was given to critics of the radical procedure.

Mr. JAMES CROOKS attached great importance to a general consideration of inflammation involving the whole of the upper, and even the lower, respiratory mucous membrane. He emphasized the mistake of focusing attention on the sinuses alone when their disease was only part of a more widespread condition. The same wide view must be taken in considering prevention and treatment. Prevention lay in avoiding germ-laden and otherwise unhealthy surroundings; cure of catarrhal nasosinusitis called for change of air and improvement in hygiene, and often nothing further. He had found the antra and ethmoids much more frequently infected than other sinuses. Acute suppuration in children demanding treatment was not common; chronic infection was frequent. General treatment, including correct diet, and hygienic surroundings, if possible a change to the seaside, were of prime importance in treatment. Ephedrine replacement was very valuable in catarrhal infections of the ethmoids. The antrum which was retaining products of inflammation should be washed out, and this could be done satisfactorily under local anaesthesia, even in young children, with very good results. In more severe infections, where granular pus was present, operation might be necessary. Intranasal antrostomy gave disappointing results, and he now preferred the radical operation.

Mr. J. D. MCLAGGAN classified cases of nasal discharge associated with pathological changes in the mucous membrane of the sinuses in children in three groups: (1) acute infective sinusitis, (2) chronic infective sinusitis, (3) allergic sinusitis. These three conditions were considered separately and the treatment of each was discussed. He emphasized the need for avoiding operation in cases of allergic sinusitis. Any operation in such cases must be restricted to maintaining a nasal airway.

Mr. JOHN GERRIE (Aberdeen) produced statistics showing that 29 per cent. of 300 cases coming for tonsil-adenoid operation had antral suppuration. He found that three lavages at weekly intervals usually sufficed to clear the infection. Some cases were more resistant, and others became reinfected, so that accessory measures were desirable. These measures comprised: (1) avoidance of carriers, (2) improvement of sinus ventilation, (3) recognition and treatment of allergic factors, (4) combined use of lavage and chemotherapy. He had found in this latter connexion that sulphapyridine (M & B 693) had produced excellent results, particularly if the unpleasant side-effects of this drug were eliminated.

Mr. J. H. OTTY (Aberdeen) said he had found the results of intranasal operation bad. The treatment of allergy was also disappointing. Mr. V. E. NEGUS said that, in his experience, most cases of sinusitis in children were cleared by removal of adenoids. But he insisted that this operation, to be efficient, required extreme care. He never thought it necessary to puncture antra at tonsil-adenoid operations. In allergic cases he considered the administration of alkali and reduction of carbohydrates most helpful.

Dr. J. ADAM (Glasgow) stressed the importance of treating sinusitis in children to avoid the later development of atrophic rhinitis and bronchiectasis. He compared the bony changes in the antral wall due to chronic suppuration with those in the temporal bone due to chronic suppurative otitis media. He asserted that most allergic cases in children would clear up on a milk- and sweet-free diet, by the administration of calcium and vitamins, and by hydrotherapy. Dr. I. SIMSON HALL (Edinburgh) maintained that the most important factor in treatment was an adequate airway, and in his experience the restoration of this, as by removal of adenoids, was all that was necessary. He entirely disagreed with Dr. Adam's claims in the allergic group, and found the best results in these followed removal of adenoids supplemented by ionization.

Mr. LIONEL COLLEDGE asserted that the majority of cases in children recovered quickly. Most of those not resolving were really cases of vasomotor rhinitis. Others were sequels of exanthemata, and in a few cases the radical antrum operation was justified. Mr. A. MACKENZIE ROSS (Poole) drew attention to the possibility of a chronic diphtheritic infection of the antrum in diphtheria carriers. He had found most cases of chronic infection recover after tonsil-adenoid operation—the few cases which did not should have lavage. Dr. W. P. PHILIP (Cambridge) stated that many cases of atelectasis in children were secondary to sinusitis. Hence the importance of sinus treatment if bronchiectasis were to be avoided.

Mr. GUTHRIE in reply admitted the important role of adenoids, but declared that the adenoids could in many cases be secondary to sinusitis. Most of the cases discussed had already had adenoids removed. The radical operation had been condemned by many, but it was preferable to the intranasal type. He agreed with Dr. Adam's remarks on sweets. Mr. CROOKS also stressed the fact that the majority of his quoted cases had already had tonsils and adenoids efficiently removed. He had, so far, seen no injurious results following the radical antrum operation.

Laryngeal Skiagrams

Mr. R. SCOTT STEVENSON showed a number of lantern slides of skiagrams of the larynx under pathological conditions, and the normal process of ossification was illustrated. This technique was useful in delimiting a neoplasm, and in demonstrating a neoplasm inaccessible to indirect laryngoscopy where direct laryngoscopy was refused.

Dr. CHEVALIER L. JACKSON (Philadelphia) stressed the value of laryngeal skiagrams in outlining the lower extent of a neoplasm of laryngopharynx or base of tongue. In his clinic all tracheotomized patients were *x*-rayed to determine whether the tube was satisfactory. He said that tomography was being developed, and was specially valuable in distinguishing between tumour and laryngocele.

SECTIONS OF RADIOLOGY AND OF PATHOLOGY

Thursday, July 27

Radiosensitive Tumours

With Dr. RUSSELL J. REYNOLDS in the chair, the Sections of Radiology and of Pathology met to consider jointly the non-infective enlargements of the lymph nodes and their radiosensitivity.

Dr. J. RALSTON PATERSON (Manchester), who contributed the only paper, said that it was becoming apparent that in their response to radiotherapy malignant growths did not constitute a complete series from ultrasensitive to totally resistant, as had for long seemed to be the case. With very limited exceptions the various tumour species seemed to fall into one of three quite distinct groups. (*a*) Radio-resistant tumours. This group seemed to include all adult mesodermal tumours. (*b*) Tumours of limited sensitivity—of which the squamous-cell carcinoma was the pattern prototype. Tumours of this group could only be cured if of limited size, and even then only by high-dosage irradiation. (*c*) Tumours of high sensitivity.

Dr. Paterson's paper dealt with the last of these three groups, and stressed the fact that there were a large number of spectacularly sensitive neoplastic growths. This had been appre-

ciated for some considerable time, and many contributions existed in the literature outlining clinical histories of series of individual sensitive tumours. No attempt appeared to have been made at any comprehensive classification of what at first seemed to be a most heterogeneous collection of apparently dissimilar growths. Dr. Paterson expressed the opinion that sensitive growths could be shown to be, in fact, classifiable into two main groups: (*a*) embryonal tumours; (*b*) the reticulo-endothelial neoplasias. In the first group were only a very limited number of growths, whose special sensitivity had long been recognized. He contended that, with few or no exceptions, all other sensitive tumours came within the compass of the second group, and that these included tumours of lymphoid, haematopoietic, endothelial, or reticular origin. The group could be considered from the point of view of radiotherapy almost as if it was a single tumour species within which the problems of therapy were relatively constant, regardless of actual individual tumour type. An outline was then given of Dr. Paterson's present treatment policy in dealing with tumours falling into this category.

Dr. Paterson expressed the view that the establishment of a registry for diseases of the reticulo-endothelial system similar to the registry of bone sarcoma would be of great value in the further investigation of this wide group.

Dr. RUSSELL J. REYNOLDS supported Dr. Paterson's suggestion for a registry for diseases of the reticulo-endothelial system, and expressed the view that Dr. Paterson's classification of these conditions according to their radiosensitivity might prove to be of considerable importance.

SECTION OF ORTHOPAEDICS

Thursday, July 27

Delayed Union and Non-union of Fractures

With Mr. A. MITCHELL (Aberdeen) in the chair, Mr. R. I. STIRLING (Edinburgh) and Mr. NAUGHTON DUNN (Birmingham) opened a discussion on the causation and treatment of delayed union and non-union of fractures. Both papers were published in the *Journal* of July 29 (pp. 219 and 221).

Opening the general discussion, Dr. P. D. WILSON (New York) thought that some of the disastrous results of non-union in plated fractures might be due to electrolysis set up by the metal, and favoured plating by non-ferrous metals such as vitallium. He himself used vitallium screws for fixing bone grafts, and with secure fixation he could more confidently start early mobilization. He was very appreciative of Mr. Naughton Dunn's subcortical approach, and described his own method of tibio-fibular grafting in cases of non-union of the tibia. Mr. A. H. TODD deprecated the condemnation of plating and pointed out the good results obtained by Lane personally, who, he said, never advocated plating compound fractures. Mr. H. O. CLARKE (Manchester) from personal experience endorsed Dr. Wilson's approval of the use of vitallium screws in bone grafts. Mr. N. ST. J. G. D. BUXTON doubted Mr. Stirling's suggestion that damage to the nutrient artery was itself an important factor in causing non-union. He thought that too long immobilization might in some cases delay union and that, especially in oblique fractures of the middle third of the tibia, it was better to get the foot to the ground; it was surprising how quickly consolidation took place.

Replying to a question of Mr. Clarke's, Mr. STIRLING said that every conservative method should be tried before operating, but that, if operation was necessary, about the tenth day after the fracture was the optimum time. He agreed with Mr. Buxton that it was surprising how quickly consolidation took place in some cases after ambulant treatment was begun.

Mr. NAUGHTON DUNN, in reply, said that in spite of good results obtained by plating in the hands of certain brilliant individuals, too many disastrous results were seen to make plating a method to be encouraged in the practice of orthopaedics.

Treatment of Open Fractures

With Mr. ALEXANDER MILLER, vice-president, in the chair, Mr. W. C. GISSANE opened the discussion by saying that the preliminary period of treatment for shock could be cut short if it was appreciated that anaesthesia itself relieved shock. This enabled one to proceed with the radical excision of the devitalized tissues as soon as possible after the injury. Infection thus having been prevented, the fracture should be reduced and the wound closed by direct suture or, if necessary, by immediate skin graft. Some injuries by motor tyres caused such a stripping of the skin and subcutaneous tissues that any attempt to replace the skin flap would produce gangrene, and it was his practice in such cases to skin-graft extensively after radical débridement. Once the wound had been closed the limb should be immobilized in plaster-of-Paris for at least five weeks.

Mr. G. H. STEVENSON (Glasgow) was emphatic that first-aid treatment should be confined to a large simple dressing of flavine and adequate splinting; and that the use of iodine and tourniquets should be debarred. He agreed with Mr. Gissane's point that anaesthesia was itself a method of treating shock and should therefore not be unduly delayed. He favoured gas-and-oxygen and did not advocate the use of spinal anaesthesia, which had given bad results in the war, nor could he bring himself to use local anaesthesia for fear of inflicting further trauma on an already traumatized limb. He described in detail his method of wound toilet, and favoured using bipp in cases that could not be closed. He suggested the use of the new streptocidal drugs, but pointed out that they were only beneficial after partial immunity had been established.

Mr. ZACHARY COPE was of the opinion that if wounds were from within out, then antiseptics were indispensable. Mr. E. T. C. MILLIGAN said that spinal anaesthesia was most useful in combating shock provided too much fluid had not been lost. Its use was contraindicated if the blood pressure fell below 90 mm. Hg. He congratulated Mr. Gissane on his skin-graft technique and thought it was a valuable contribution to traumatic surgery. Mr. A. H. MCINDOE emphasized the importance of skin grafting, but said it was not easy, and he thought that the traumatic surgeon of to-day should have training in plastic surgery. Mr. STIRLING pointed out that débridement was facilitated by swabbing the wound with 1 per cent. solution of methyl-violet, which differentiated vital from non-vital tissue. Dr. P. D. WILSON (New York) doubted the policy of closing open fractures and favoured the Winnett-Orr technique after débridement. He stressed the importance of adequate early immobilization by the use of traction splints in first-aid posts, which was now the usual practice in the U.S.A., where he also understood sulphonamide was being used routinely as a prophylactic measure.

Mr. GISSANE, in reply, still thought that antiseptics were dangerous in open wounds. He was not averse to delayed skin grafting, but it was not his usual practice.

Leaflet No. 6 in the series issued by the Department of Scientific and Industrial Research on methods for the detection of toxic gases in industry deals with carbon bisulphide vapour (H.M. Stationery Office, 3d.). The situations where this vapour may occur in dangerous concentrations include works where the following are manufactured: artificial silk (viscose), chemicals, coal gas, vulcanized and "dipped" rubber goods, and tar distillation products. In high concentrations it may cause delirium, coma, and death from respiratory failure. The better-known effects, however, are those of a severe chronic poisoning of the nervous system with a great variety of symptoms, varying in degree from slight fatigue and giddiness to serious mental derangement, blindness, and paralysis. It is stated that the permissible concentration of carbon bisulphide vapour in the atmosphere of workrooms should be kept well below one part in 30,000 of air, and preferably not above one part in 100,000. Full instructions for carrying out the tests are contained in the leaflet.

EMERGENCY HOSPITAL AND RADIUM STORE AT NORTHWOOD

A party of journalists formed the principal audience when on August 2 in the ample grounds of Mount Vernon Cancer Hospital, Northwood, Middlesex, the Viscountess Harcourt, chairman of the Board of Governors, turned the first sod of one of the first of the series of emergency hutment hospitals in the greater London area.

Mount Vernon is the advance base in the fifth of the ten sectors which radiate from the London teaching hospitals. Of this particular sector Middlesex Hospital is the key, and there are to be three other emergency hospitals in the same sector—namely, two at Aylesbury, one of these being the present public assistance institution and the other the Royal Buckinghamshire Hospital, and the third at Bedford. At the beginning of an emergency, surgeons, nurses, and other staff will be sent from the Middlesex in the first place to Mount Vernon and the clearance of cases from the in-town hospital will be undertaken. It is hoped that it will be possible for all operations to take place at Mount Vernon, so that after operation the patient can remain there instead of being moved as might be necessary in an inner hospital. The Middlesex Hospital will have its beds reduced from its present number of 700 to 320, of which 200 will be labelled for casualties. The occupants of these beds will be transferred to Mount Vernon as quickly as possible.

Arrangements at Mount Vernon

The hutment hospital is designed in the first instance to take 360 beds (ten huts with thirty-six beds each), with accommodation for medical staff and nurses. It is expected that this will be completed within three months. The erection of the hutment hospitals would have been accomplished earlier, but the Government decided that the huts for militiamen must have precedence. The secretary of the Middlesex Hospital, Mr. S. R. C. Plimsoll, said that his authorities desired to express their gratitude to the London County Council as to the other county authorities, who were showing the most generous and broadminded spirit in all these arrangements. The London County Council, for example, had placed its mobile engineering units at the disposal of the voluntary hospitals for this purpose. The site planning and supervision of the erection of the emergency hospitals have been entrusted to a number of well-known hospital architects. At Mount Vernon there will be the closest co-operation between the new emergency and the existing hospital, and the resources of the latter, including its well-equipped *x*-ray department, will be available.

Safe Storage of Radium

Mount Vernon is now the central hospital of the Empire Cancer Research Board and is combined with the Radium Institute near Portland Place, which is responsible for the loan of radium to many hospitals throughout the country. It is expected that should war break out radium treatment will practically cease for a time, and all the radium under the control of the Radium Institute will be immediately sent to Mount Vernon, where a shaft fifty feet deep has been bored in the ground for radium storage. The value of the radium so buried may represent many millions of pounds, and great precautions have been taken to ensure its safety. The governing consideration, however, has been that in the case of radium stored in the ordinary way, should an enemy bomb burst open the containers, it would be impossible to collect the radium once scattered, and the area of such destruction over a considerable radius would remain a permanent death trap. An attempt was made to give some estimate of the bodily damage which might be done through dispersed radium, but any such estimate must, of course, be fantastic. A special building has been erected over the shaft at Mount Vernon, with a wall of concrete to protect the person manipulating the radium carrier, and the radium, if and when it arrives, will be enclosed in brass boxes, ten grammes in each, and lowered by means of a pulley into the depths.

Local News

AUSTRALIA

Queensland Nutrition Council

The Queensland Nutrition Council, of which the Queensland Branch of the British Medical Association is a member organization, held its third annual general meeting recently at Brisbane. The report which was presented makes the claim that Queensland has set a standard of nutritional development which has no parallel in the Commonwealth. At the last meeting of the Australasian Association for the Advancement of Science, which was held at Canberra, the demonstration of the work done in Queensland drew many admiring comments from leaders in the public health field of other States. It is stated also that the work on nutrition is reflected in statistics which show that the food habits of the people are changing in the direction of a higher standard of community health. Various nutrition study groups as well as local committees in rural centres have been formed under the auspices of the council. A noteworthy enterprise is the twice-weekly series of dramatized broadcasts given under the title of "Nutrition News," over 250 having been given from the broadcasting station. The British Nutrition Film has been modified to suit local conditions and has been distributed throughout Queensland. A wall chart giving a guide to menu planning is in its tenth thousand. Along with all this the more usual work of lectures and demonstrations to housewives and others has been vigorously pursued, and boarding schools have been invited to send copies of their school diet for helpful criticism. In research an investigation has been carried out on the vitamin C content of Queensland fruit and vegetables, which has revealed the high value in this respect of the pawpaw—a product at present unfamiliar to this country—said to be twice as rich in vitamin C as orange juice. Other findings are the relatively low value of lemon juice, the high and uniform figure for orange juice, and the fact that the vitamin C of lettuce is rather rapidly destroyed once it is picked, only 30 per cent. of the vitamin remaining after twenty-four hours. The researches have been carried out under the direction of the professor of physiology and the lecturer in biochemistry at the University of Queensland. Other work of the council has taken the form of co-operation with various bodies in providing fresh fruit and vegetables under conditions of refrigeration to the people of the isolated north-west, and a study of the efficiency of distribution of staple foods in the State generally. Simultaneously with the meeting of the National Council the Brisbane *Courier-Mail*, the principal newspaper in Queensland, published its fourth annual "Nutrition Supplement," a copy of which has been sent to us. It is a lively production, and contrives by headlines and smiling photographs to get its message across. The president of the National Council is Mr. Douglas H. K. Lee, professor of physiology at the University, and the chairman is Dr. Noel Gutteridge.

South Australian Medical and Veterinary Institute

The new laboratories of the Institute of Medical and Veterinary Science, South Australia, have been officially opened by the Lieutenant-Governor, Sir George Murray. The institute partly represents an extension in Adelaide of pre-existing facilities for the study of pathology, bacteriology, and biochemistry as applied to human and to animal medicine; partly it is a new development. Its principal purpose is threefold: first, to carry out, with more adequate accommodation, equipment, and staff than heretofore, routine investigations for the Adelaide Hos-

pital, the Stock and Brands Department, country hospitals, and private practitioners; secondly, to engage in research into the causation, diagnosis, and cure of disease in man and animals; thirdly, by close collaboration with the University of Adelaide teaching departments of pathology, bacteriology, and applied physiology, to inculcate in the medical students a proper appreciation of the importance of laboratory medicine, and to imbue them with a scientific outlook. The buildings, which have been erected at a cost of upwards of £50,000, are of the most modern design, and the problems of sound-absorption, heating, and ventilation have received special attention. A large sum has also been expended on new scientific apparatus and instruments of precision. The institute is governed by a council of six, representing the board of the Adelaide Hospital, the University of Adelaide, and the veterinary interests of the State. Of this council the director is the principal executive officer. Under the director are the departments of bacteriology, clinical pathology, biochemistry, and veterinary pathology, each controlled by a head who is responsible for a group of research workers. With a view to future expansion accommodation has been provided to allow for augmentation of the present staff.

ENGLAND AND WALES

Bust of Lord Moynihan

On October 2 the bust of the late Lord Moynihan by Sir William Reid Dick, R.A., which was shown at the Royal Academy exhibition this year, will be presented to the General Infirmary at Leeds. The date has been chosen because it is the anniversary of the birth of Berkeley Moynihan in 1865 and of his entry as a student of the Leeds Medical School more than fifty years ago. The bust, towards which friends, patients, and members of the Infirmary board and students have contributed, will be unveiled by Mr. Hugh Lett, President of the Royal College of Surgeons of England. According to the *Yorkshire Post*, it will stand half way up the main staircase facing the entrance to the Infirmary, and Sir Edwin Lutyens, P.R.A., has collaborated with the sculptor in designing its pedestal and niche. Since Lord Moynihan's death in September, 1936, Ward 4 has been named after him, because it was there that he worked as a student and surgeon for fifty years.

L.C.C. Research Unit in Gastro-enteritis

A team research on gastro-enteritis in children is to be initiated at the North-Eastern Hospital of the London County Council at South Tottenham under the general pathological direction of the pathologist of the group laboratory at the North-Western Hospital. This proposal follows the finding of a committee which was set up by Sir Frederick Menzies, county medical officer of health, in 1937 to inquire into the clinical condition of non-specific gastro-enteritis in infants with a view to ascertaining the lines upon which clinical and pathological research could best be carried out into the aetiology, mode of transmission, and treatment of that disease. The suggestion was made that a special unit should be established at a fever hospital for clinical and pathological study, including methods of controlling the spread of infections and methods of treatment, and that a more intensive bacteriological, histological, and biochemical investigation should be instituted. It is considered by the Hospitals and Medical Services Committee of the L.C.C. that a whole-time non-resident clinician with good experience in paediatrics and a whole-time assistant pathologist should be appointed, their appointments to be tenable for three or four years, and that one of the resident medical officers at the hospital should be deputed to work under the research clinician. As the question of ward infection enters into the problem of the spread of gastro-enteritis, the clinician and pathologist appointed will work in consultation with Professor H. D. Wright (Liverpool), Dr. W. H. Bradley (Cambridge), and Dr. Joyce Wright (London), who are already engaged in the study of the epidemiology of ward infections with support from the Medical Research Council. The scale of salary for the clinician and assistant pathologist is to be £500-£50-£600 a year in each case.

£100,000 to fight Paralysis and Other Crippling Diseases

Sir Alexander Maclean, noted for his numerous benefactions, has given £100,000 to the Lord Mayor Treloar Cripples' Hospital, for the construction of a new seaside branch of the hospital at Sandy Point, Hayling Island. He, accompanied by Sir Henry Gauvain, medical superintendent of the hospital, visited America especially to study hydrotherapeutic treatment (under-water gymnastics) for infantile paralysis and other crippling conditions. So impressed was he with this method of treatment and its manifold advantages that he determined that English sufferers should have similar facilities, and the new marine hospital will be fully equipped for this purpose. It is therefore proposed to build at Hayling Island a new hospital with therapeutic pools and sea-water baths designed on the latest scientific principles. Patients attacked by infantile paralysis are often left with limbs so weak that they cannot move them against the resistance of the beds on which they recline. It is primarily to help such sufferers that the new hospital is being designed, and child patients from any hospital in the British Empire requiring special treatment will be eligible for admission.

Correspondence

The Swivel in Treatment of Fractures in the Long Bones

SIR,—A fracture of the long bones may result in shortening of the limb, angulation at the site of fracture, and an alteration of the rotational relation of the lower fragments in relation to the upper. The shortening and angulation are usually readily overcome by traction, but most of us depend on our own judgment for correction of the last. We therefore not infrequently find that locking of the fragments is difficult to establish, and when union has occurred the proximal and distal joints are not acting in true alignment.

I believe that by the use of the swivel these difficulties can be largely eliminated. The principle of its use in ensuring correction of rotational alignment is a very simple one. If we insert a swivel in the line of the traction between the limb and the distracting force, the tension on the soft structures, tendons, muscles, interosseous membrane, etc., ensures the anatomical alignment of these, and they in turn determine the natural degree of rotation of the lower fragments in relation to the upper. Although perhaps most valuable in ensuring true reduction of fractures of the forearm bones, I believe that the principle is one which can be used with great advantage in all fractures which necessitate traction for their reduction.—I am, etc.,

NAUGHTON DUNN, LL.D., M.B., Ch.B.,
Lecturer on Orthopaedic Surgery, Birmingham University.
Birmingham, Aug. 3.

Argyria due to Intranasal Medication

Sir,—Dr. W. F. Macdonald's report in your issue of August 5 (p. 279) of a case of argyria due to the use of an intranasal spray containing silver encourages me to put on record a somewhat similar case of a lady who was sent to see me on account of a curious pigmentation. The blood had previously been examined spectroscopically for methaemoglobin and sulphaemoglobin with a negative result. I thought the pigmentation highly suggestive of argyrism, and on inquiry I found that owing to a misunderstanding she had been using a preparation containing 20 per cent. silver iodide continuously for more than three years, instead of using it only occasionally when her gums were swollen and sore. This instance reinforces Dr. Macdonald's warning.—I am, etc.,

London, W.1, Aug 7. W. Langdon-Brown.

Dentures after Extraction

Sir,—The writers of the article on dental sepsis (Drs. J. M. Vaizey and A. E. Clark-Kennedy) in your issue of June 24 (p. 1269) stress a point which is too often disregarded, to the great disadvantage of the patient—namely, the importance of immediate prosthesis after extraction of all the natural teeth. A person suddenly rendered toothless is in misery. The inability to eat with its consequent handicap to digestion, the difficulty of speech, the alteration in appearance, and general discomfort combine, particularly if the patient be a woman, to produce a degree of mental depression which may be quite serious, especially in cases where health is already impaired. Moreover, if more than a short time elapses before the fitting of dentures, changes take place in the temporo-maxillary joint and in the muscular balance which make their use more difficult when eventually they are supplied. Also, it is generally held that there is more absorption of the alveolar ridges during a waiting period than occurs if they have to bear the pressure of mastication from the first. It may not be generally realized that all this is usually quite avoidable; that, although at present it is the exception rather than the rule, adaptation of dentures at the same time as the last teeth are removed is practically always possible; and that the necessity for the patient to leave the dental chair edentulous need rarely occur. To achieve this result involves, of course, careful planning on the part of the dentist and some extra expenditure of time and trouble, but this is more than repaid in comfort and efficiency. The only objection is economic, and this unfortunately operates in the case of the national health insurance patient, who is condemned to toothlessness, with all its accompanying evils, for a minimum period, often greatly extended, of three months.—I am, etc.,

Jamaica, July 16. J. H. Badcock.

Tracheitis

Sir,—I was interested in the letter on tracheitis from Dr. B. Burnett Ham in the *Journal* of July 29 (p. 250) because in my opinion it is of frequent occurrence in general practice. Acute tracheitis is a common malady in young and old, and usually follows some upper respiratory passage infection. In adults the common complaint is a dry, painful, spasmodic, and exhausting cough with some vague pains over the sternum, or even pain in the abdominal muscles from the strain of coughing. Some patients state that the cough "makes me sick." On examination of the lungs one is usually struck with the absence of physical signs, adventitious sounds, etc., unless later on bronchitis develops. The temperature is usually normal, unless affected by any other concomitant condition. Indeed, so great is the contrast between the patient's complaint and the absence of physical signs that at times one is rather dubious about the patient's statements as to his sufferings! One is still somewhat reluctant in writing a certificate for the patient, in the absence of bronchitis, to call the condition "bronchial catarrh" when "tracheitis" would perhaps be a more appropriate term. In children one has to be careful to exclude whooping-cough. The treatment in such cases is, apart from the special attention to the responsible causative agents in the upper respiratory tract, rest (if possible); other hygienic attentions; medicated hot steam inhalations; and sedative mixtures to relieve the dry, spasmodic cough. A useful mixture is some belladonna in a linctus, and later on even the addition of some pot. iod. in order to facilitate the expectoration.—I am, etc.,

Surbiton, July 30. L. B. Shelton.

Sir,—In reading the letter by Dr. Burnett Ham I am disposed to question whether the cough he describes is due to a tracheitis. I have observed such a cough in very many cases over a period of many years, not only in conjunction with tuberculosis clinics but also outside this work. I have even experienced it personally. The cough I have observed is exactly as described by Dr. Ham, with the exception of hoarseness. The paroxysms may often, and in fact do, give rise to nausea and retching, but with no "whoop," and are accompanied by a feeling of constriction and soreness behind the sternum, which may be felt as high as the larynx—due, I have always presumed, to the intenseness of the cough and inability to "bring up" the offending irritation. The cough is often worse after meals and is incited by exertion. It may come on at night-time when the patient takes a prone position in bed, and then perforce has to sit up the better to deal with the paroxysms. The sputum is scanty and sticky and, when vomiting is almost induced, mucoid and bitter. I have never observed the "soot-like particles." The patient may sometimes complain of having a "cold," but more often I seem to have observed that the patient suffers with a gastritis or, as they say, "indigestion"—in other words, hyperacidity.

For my own purposes I have always classified this cough as a "stomach" cough—that is, gastric in origin, perhaps due to vagal irritation. For long I have treated this type of cough with small drinks of bicarbonate of soda, which work like magic, to the profound astonishment of the patient. I have never met this treatment elsewhere, and am glad to have it corroborated in Dr. Ham's letter. I agree that ordinary cough mixtures are useless in affording relief, but heroin I have always advocated and used as a linctus if the paroxysms have not been entirely abated by the sodium bicarbonate.—I am, etc.,

Bournemouth, July 31. Charles F. Pedley.

Bee-sting Anaphylaxis

Sir,—I was interested to read the letters you have published recently about the effects produced by what one might call massive stinging by bees. They remind me of a lady, an enthusiastic bee-keeper in the middle sixties, to whom I have twice been called urgently.

On the first occasion, in June, 1937, I was summoned at 8.30 p.m. The patient had been stung by her bees in about

twenty places on the hands and legs. Both hands were greatly swollen, as were the legs, but the striking thing one noticed was the appearance of a general allergic reaction. There was gross oedema of the face and eyelids, and the trunk was covered by a diffuse erythematous eruption. There was a moderate degree of shock. I gave her half-grain tablets of ephedrine hydrochloride night and morning, and a lotion of sodium bicarbonate to bathe the skin. On the following day the allergic signs had completely disappeared, but it took another day or two for the local swellings about the stings to subside.

On the next occasion when I was called in the picture was completely different. This was in May, 1938. I was summoned again in a hurry about midday to find that my patient had been stung by a swarm of bees in the face, scalp, and wrists. I found her conscious but in a state of profound collapse, pale, cold, pulseless, and vomiting. Her appearance was ghastly, and I thought she was going to die. An injection of coramine was given, followed an hour later by a cup of strong black coffee. By the evening the signs of profound shock had passed off, and by the following day she was in her normal state of health once more. On this occasion the signs of allergic reaction were completely absent, but the extreme degree of collapse was most alarming.

I strongly advised the lady to give up keeping bees, but in spite of her unpleasant experience she declined to listen to my words of wisdom. So far this year I have not heard of any repetition of the stingings.—I am, etc.,

Bridlington, July 30. C. J. GORDON TAYLOR.

SIR,—As a beekeeper may I ask what instructions I should leave (as presumably I would not be able to give them at the time) for use by lay members of the household in the event of my being seriously affected by a sting.—I am, etc.,

Norwich, Aug. 5. ARTHUR GREENE.

Daily Records of Blood Pressure

SIR,—The report on the standardization of methods of measuring arterial blood pressure, published in your issue of July 22 (p. 184), prompts me to write on some personal observations. I recently made daily records of the blood pressure over a period of several weeks in eight cases of catatonic stupor. In this type of case acrocyanosis of the extremities and low blood pressure are common, but, as these signs are by no means peculiar to catatonic stupor, the following list of my findings may be of interest.

(1) Where the systolic pressure was between 85 and 95 mm. Hg, immersion of the arm in a bath of hot water resulted in a subsequent reading which was 10 to 15 mm. higher. The pressure continued to remain at the original low level in the untreated arm. The same result was obtained whether the pressure was recorded by palpation or auscultation. I draw a conclusion from this that one cannot obtain a true systolic reading in such cases without first causing vasodilatation of the arm by immersion in hot water.

(2) The diastolic reading can be made to vary according to the pressure of the stethoscope on the brachial artery. I found that it was more accurate to use a diaphragmatic type of stethoscope, which requires a very light pressure. For the same reason it is easier to take as the diastolic reading the point of disappearance of sound.

(3) The systolic pressure varied as much as 40 mm. on successive days without any outward signs of change in the patient's mood.

(4) Neither the systolic nor the diastolic pressure was materially different whether the patient was examined in a recumbent or a sitting position.

(5) An increase of pulse rate (due to emotional excitement) of up to 40 beats a minute, on two successive days' records, was on some occasions not accompanied by any alteration in the systolic blood pressure.

I would like to emphasize that I have only observed these points in cases of mental disorder in which the blood pressure was abnormally low. I do not know whether my observations have any general application.—I am, etc.,

Shenley, Herts, Aug. 2. OTHO FITZGERALD.

Sleep Charts

SIR,—I am most grateful to Drs. Richard Eager and Bruce Williamson for drawing attention to sleep charts in use for many years (*Journal*, July 22, p. 198). My first difficulty in wishing to collect accurate records of sleep from large numbers of cases was that, according to two of the largest medical publishers in this country, sleep charts could not be bought. Consequently I drew up one which has now been used on many patients. I did not believe, or write, that such charts did not exist "in the literature," but that they did not "appear" to exist—that is, for the general medical public.

Professor R. H. Steen's method of recording sleep, referred to by Dr. Eager, consists of a square for recording the total amount of sleep for each twelve hours. The observer must keep notes of the sleep elsewhere. This is really a record rather than a chart. Dr. Bruce Williamson's chart is in a different category. Personally I fear that a nurse, particularly when tired in the early morning, would very easily make errors in the length of the horizontal lines necessary. I think also that recording periods of "broken sleep" is probably more inaccurate than noting if the patient is awake every fifteen minutes, despite the obvious errors in the last method.—I am, etc.,

Bristol, Aug. 1. G. DE M. RUDOLF.

Pre-auricular Fistula

SIR,—During a recent holiday at a small Welsh seaside resort I noticed a sturdy boy of about 4 years playing on the beach—at least, I thought he was a boy until his brother called him by a girl's name, since the hair, though thick, was cut short like a boy's. Just in front of the right ear was an ulcer the size of a sixpence, and I do not doubt that all sorts of treatments had been tried in vain, the most drastic, perhaps, being the cropping of the hair. I took the opportunity of getting close to the child, as I strongly suspected that the condition was one of pre-auricular sinus. There was certainly no other skin disease, and, so far as one could tell by a quick look, no trouble in the scalp. At the root of the helix, however, was a tiny opening in a forward and slightly downward direction. That fact was the diagnostic feature, and the case fits perfectly with those I described in the *British Journal of Surgery* in 1927. This paper unfortunately received little attention apart from dermatologists.

The full condition is as follows. The pinna is formed by the fusion of six tubercles, but just occasionally the fusion between two adjacent ones is not quite perfect and a tiny tubulo-dermoid results and runs forwards and slightly downwards from a minute opening at the root of the helix or tragus. This blind track is lined by skin and is about a quarter to half an inch in length. More often than not no trouble arises, and often enough the person is quite unaware of his possession, even though it tends to run in families. Sometimes the minute opening becomes blocked for a while, and the accumulating skin secretions form a smooth swelling, which slowly disappears when the opening becomes patent again. But sometimes infection occurs too, and then an abscess develops and ulceration supervenes, either spontaneously or as the result of surgical intervention; and, having

developed, it remains, refusing to respond to treatment, since its infection is maintained by the infected skin track. If a bristle be passed gently forward through the opening at the root of the helix or tragus it will emerge through the base of the ulcer. It is true that the ulcer may heal temporarily, but recurrence invariably takes place, and the only cure is excision of the skin track. If ever a persistent or recurrent ulcer develops over the zygoma, about half an inch in front of the ear, the condition of suppurating pre-auricular sinus should be remembered; the tiny opening described above is the diagnostic point. The condition is exactly akin to suppurating sacro-coccygeal sinus.

—I am, etc.,

F. A. R. STAMMERS, Ch.M., F.R.C.S.

Birmingham, July 31.

Foreign Bodies in Bladder in Attempted Abortion

SIR,—Mr. A. H. Charles in his article in the *Journal* of July 29 (p. 224) states: "Most authors claim that foreign bodies can usually be removed from the bladder per urethram, but there is no case quoted where this was successfully accomplished when the instrument used was slippery elm."

Last year I removed a piece of slippery elm about two and a half inches long and the diameter of a pencil by what I like to call "a bimanual operating cystoscope"—in other words, an ordinary small cystoscope and a short pair of Patterson crocodile forceps, the forceps being introduced alongside the cystoscope. By this means one can grip the end of a piece of elm and draw it out endwise. It is a little difficult at first to work with the long axes of the two instruments parallel. A week later, on cystoscopy, the bladder appeared normal. Using this method, a colleague of mine removed a similar piece of slippery elm per urethram, on a subsequent occasion, from another patient.

I agree that an operating cystoscope is not a suitable instrument, the jaws being too small—it is like trying to grip a telegraph pole with a pair of pliers!—I am, etc.,

London, W.1, July 29. C. LAURENCE HEANLEY, F.R.C.S.

Frank-breech Presentations

SIR,—I am grateful to Dr. J. McAuley (July 29, p. 250) for his very pertinent criticism of my article on the frank-breech. I should have made it clear that the midwife is only given 60 minims of chloroform in a bottle which only allows a "drip" administration, and that a Kirby Thomas mask is used with a single layer of lint.—I am, etc.,

Birmingham, July 31. V. MARY CROSSE.

Haemophilia in Absence of Family History

SIR,—In the *Journal* of July 22 (p. 198) Dr. A. Genevieve Rewcastle asks whether there is a reasonable explanation for the occurrence of haemophilia in the absence of a family history of the disease. Haldane (*J. Genetics*, 1935, **31**, 317) has estimated the frequency of mutation at the haemophilia locus at roughly 1 in 50,000, and has shown that of all genes for haemophilia existing at any specified time one-quarter to one-third are mutants. To form an idea of what proportion of affected sibships shows no family history it will be convenient to consider separately the two principal groups into which affected sibships may be divided—those whose affected members are themselves mutants and those whose mothers are heterozygotes or "carriers." Various other possibilities, such as affected father, affected mother, or sibships having heterozygous mothers but being affected by being themselves mutants, are all relatively rare, and will be ignored.

For convenience, the proportion of genes for haemophilia which are themselves mutants will be represented by f. Since the frequency of mutation at this locus is very small, we may neglect the small probability of two or more mutations in a single sibship. It follows that all affected sibships may be regarded as of two kinds, those containing mutants and those whose affected members inherited the disease, and it may be taken that those containing mutants contain only one mutant each. Therefore the proportion of all affected sibships which contain mutants is f. The remaining $1 - f$ have the gene from heterozygous mothers, of which in turn the proportion f are themselves mutants. We have now shown that the proportion $f + f(1 - f)$ of affected sibships will have no family history. The remaining sibships, amounting to the proportion $(1 - f)^2$, may be further subdivided, some having no family history by arising from a heterozygous maternal grandmother who was herself a mutant and whose offspring failed, by chance, to have affected members, and so on, *ad infinitum*. It is therefore apparent that of all affected sibships the proportion having no family history of the disease will be in excess of $f + f(1 - f)$. (Just how much this excess would be is troublesome to estimate, for it is bound up with family size, the marriage rate, and so on.) Since f is one-fourth to one-third, as estimated by Haldane, this proportion is seven-sixteenths to five-ninths, and, remembering the small contribution ascribable to the maternal grandmother and earlier ancestors in the female line, it seems safe to say that at least one-half of all affected sibships would show no family history of the disease.

Turning to the family reported by Dr. Rewcastle, it may be noted that only three relatives are mentioned who provide information as to the genetic constitution of the family. They are the two maternal uncles and their male maternal cousin. With so little information it is not even possible to contradict the hypothesis that the mutation occurred as early as three generations before the affected sibship in the female line. That is, if the great-grandmother in the female line had been a heterozygote the chance that three of her male grandchildren should have been unaffected and that the female grandchild, who is the mother of the affected sibship, should be a heterozygote is 3 in 64, or about 1 in 21. This is not small enough to provide a satisfactory contradiction to the suggested hypothesis. In the same way it may be seen that if the maternal grandmother were the mutant there would be 1 chance in 8 that the two maternal uncles would be unaffected and that the mother would be a heterozygote. A further possibility that is wholly compatible with the family history is that the maternal grandfather was haemophilic but that the disease was not recognized.—I am, etc.,

HORACE W. NORTON.

Galton Laboratory, University College, Aug. 1.

First-aid Posts

SIR,—I have recently been put in charge of a first-aid post to be housed in an elementary school. We cannot use the school or alter it in any way until an emergency occurs. In my own case the plans, passed by the Ministry, while providing the orthodox suites of rooms for gas and first aid for both sexes, make no provision for a canteen, mortuary, waiting-room for relatives, resuscitation room, separate operating theatre, etc. I realize I have not the rooms to form an ideal post.

What I want to know is what are the most urgent needs if one's accommodation is limited? Innumerable problems will arise when the post is formed on the outbreak of war, and there must be many practitioners in the country who would welcome concise instructions as to how to proceed.—I am, etc.,

Rochdale, July 31. C. HEAP.

Obituary

G. C. M. M'GONIGLE, M.D., D.HY.

Medical Officer of Health, Stockton-on-Tees

We regret to announce the death of Dr. George Cuthbert Mura M'Gonigle, medical officer of health for Stockton-on-Tees, which took place at Norton-on-Tees on July 30. Born in 1888, the only son of the late Canon M'Gonigle, formerly vicar of Ellingham, Northumberland, he was educated at the Newcastle School of Medicine and graduated M.B., B.S. of Durham University in 1910, proceeding to the M.D. in 1913. He took the D.P.H. and the B.Hy. in 1914, and the D.Hy. in 1932. In the war of 1914–19 he served at home and in France and Italy with the rank of captain R.A.M.C., having previously held resident posts at the Royal Victoria Infirmary, Newcastle-upon-Tyne. He was for a time deputy superintendent and resident medical officer at the Rampton State Asylum. During his fifteen years at Stockton Dr. M'Gonigle made a deep study of malnutrition in all its aspects, and he took an active part, as honorary secretary, in the work of the B.M.A. Nutrition Committee, whose report appeared in our *Supplement* at the end of 1933 and afterwards had a very large circulation as a pamphlet. He published in 1936 a book with J. Kirby entitled *Poverty and Public Health*, which made his name known far and wide. He was deputy honorary secretary of the Stockton Division of the British Medical Association in 1925–8, and chairman in 1931–3. For more than a year past he had been in poor health following an attack of double pneumonia, which left him with serious lung trouble.

Dr. J. A. Charles, medical officer of health for the City and County of Newcastle-upon-Tyne, writes:

At the Royal Victoria Infirmary, Newcastle, M'Gonigle was house-surgeon to Rutherford Morison. At a comparatively early stage in his career he took the diploma in public health, and entered the public health service as a member of the staff of the Durham County health department. Whatever may have influenced him in taking this step, whether the family association with local government—for his father was for many years a member of the Northumberland County Council—or the realization that for the biologically minded public health offered unexplored opportunities, it was a decision of no little importance to preventive medicine in this country. After a short period with the Durham authority M'Gonigle became medical officer of health for Stockton-on-Tees in 1924. In this borough, where he was both in word and fact a general practitioner of public health, carrying out all the duties of his office with one medical assistant, he spent the remainder of his life. Other men with smaller gifts of mind have travelled further, but M'Gonigle set aside all his disappointments—and they were many—to immerse himself in the problems of distress and poverty which for many years were outstanding in the life of Stockton. He tackled one question after another—rickets, dental caries, the nutrition of the rehoused slum-dweller—mastering his techniques as he went along, and everything he touched he stripped a little nearer to the central truth. There can have been but few more industrious field workers, and none more modest or diffident in discussing his achievements or more helpful to those of his colleagues in the service who looked to him for guidance and inspiration. The tributes which most delighted him were invitations to extend the range of his activities and inquiries and requests for his co-operation on departmental and other public committees. To all of these he contributed abundantly, and they compensated him for the preferment which he deserved so richly but never obtained.

But apart from his absorption in social medicine M'Gonigle had other interests. His friends recognized him as a wise counsellor and elected him to office in the Society of Medical Officers of Health and the B.M.A. He helped to reorganize his old medical school, of which for many years he was a governor. To those who knew M'Gonigle only as a recorder of his researches in clear and simple English his real eloquence as a speaker came as a surprise, and he was in frequent demand on public platforms throughout the North of England. An old infantile paralysis had left him slightly lame, but it also made him the constant friend of every cripple and every handicapped child. He was a keen fisherman, and his disability did not prevent him from becoming an expert and lively swimmer. His early life in a Northumberland parish gave him a love for both the sea and the countryside. That in recent years he overtaxed his strength there can be no question, but his restless and inquiring mind was never content to be idle. Time was somehow found for new work or to give ungrudgingly and gladly to others the help for which they sought. His great characteristics were courage, honesty of purpose, friendliness, and loyalty. An eager and fascinating spirit has left us, but his work and example will remain.

ROBERT REID, LL.D., M.D., F.R.C.S.

Emeritus Regius Professor of Anatomy, Aberdeen

Emeritus Professor R. W. Reid died at Albyn Place, Aberdeen, on July 28, aged 88. His name is firmly linked with cerebral surgery by reason of the landmark "Reid's base line," from the infra-orbital ridge to the external auditory meatus and the middle line of the occiput. He had been a member of the British Medical Association for sixty-four years, was vice-president of the Section of Anatomy and Physiology at the Annual Meeting in 1893, and president of the same section in 1914. He retired from the chair of anatomy at Aberdeen in September, 1925, after holding it for thirty-six years.

Robert William Reid was the third son of the Rev. William Reid, minister of Auchindoir on Donside, and received his early education at the neighbouring village school of Lumsden. He came of a family which had had its home for many generations in the north of Scotland, and which had contributed distinguished representatives to the Church, the Army, and to the fields of literature and invention. One of Professor Reid's brothers was the late Dr. William Reid, medical superintendent of Aberdeen Royal Asylum, and another was Major-General Sir Alexander John Reid. At the age of 15 Robert Reid proceeded for a few months to the Grammar School at Aberdeen, and later went to King's College. In 1868 he began medical studies at Marischal College, where John Struthers was then professor of anatomy, a subject to which from the first Reid was attracted. He graduated M.B., C.M. in 1872 at the age of 21, and after holding the post of house-physician at the Royal Infirmary started his career as an anatomist by becoming assistant to Professor Struthers. In 1873 he accepted the appointment of demonstrator of anatomy in the medical school of St. Thomas's Hospital, London. In 1877 he became joint lecturer and then senior lecturer. Sir Arthur Keith has recalled that when Robert Reid entered St. Thomas's Hospital in 1873 anatomical inquiry had come under the dominance of Darwin, and variations in structure which occur so abundantly in dissecting-room subjects had taken on a new significance and importance. Into this field he entered with zest, and in 1884 opened up a line of research in which he had no equal. In 1884 he published an article dealing with the relation of the principal fissures and convolutions of the cerebrum to the outer surface of the scalp. This placed him in the front rank of the anatomists of his time. Operations on the brain were

then in their infancy, and surgeons needed a simple, accurate, and reliable method to guide them to its various parts. This method of research entailed much exact observation and systematic records, but it is a contribution to practical knowledge, not to theory. In 1889 he published a paper of similar nature dealing with the spinal cord, which has been in great part embodied in surgical and anatomical textbooks. When the Anatomical Society of Great Britain and Ireland was founded in 1887 Robert Reid became one of its original members and was elected a member of its first council and afterwards president.

In the autumn of 1889 Professor Struthers retired from the regius chair of anatomy at Aberdeen, and Robert Reid was appointed to it by the Secretary for Scotland. For the next thirty-six years his work was carried out in Aberdeen, and included devoted teaching of many generations of students, who have since carried the precepts received from him not only into practices in the north of Scotland but all over the world. During this time, too, he enriched anthropological science by many valuable researches. He greatly developed the museum which had been initiated by his predecessor, and instituted a department of practical embryology. He was one of the first anatomists to grasp the importance of *x*-ray examination in relation to this subject. In 1896 he installed a method of making measurements and records of the physique of his students, which resulted in a record, kept over nearly thirty years, of the physical and racial characteristics of undergraduates attending the University of Aberdeen. This register contains exact measurements and details of growth of 2,000 students drawn from the population of the north-east of Scotland. It has proved of immense importance in anthropological science, and mention may be made of Professor Reid's papers drawn from it, upon the relation of cranial capacity to intelligence and on the relation between stature, head breadth, and head length of 847 natives of north-east Scotland, and his anthropometric comparison between natives of the north-east of Scotland and inhabitants of Norway and Sweden. These papers appeared in the *Journal of the Royal Anthropological Institute* for 1923 and 1924, and in the third of them the question is answered as to the race to which the Aberdonian belongs, the answer being that they are of a common stock with the Scandinavians and have little or nothing to do with the Mediterranean race or with the dark-haired, round-headed Alpine stock. Professor Reid also made valuable investigations into the relationships of the bones found in several ancient tombs in Aberdeenshire. In 1912 he published an illustrated catalogue of the anthropological museum at Marischal College, Aberdeen, in which this collection is described, and in 1924 he added an illustrated catalogue of specimens from prehistoric interments in Scotland, wherein is set down all that is known of the strange people who lived in Aberdeenshire some three or four thousand years ago. His work for practical surgery was completed during the war by an exact description of the position of the nerves in the limbs, which was published in the *Journal of Anatomy*.

HERBERT COOK, C.B.E., M.D., F.R.C.S.

Consulting Surgeon, Cardiff Royal Infirmary

We regret to announce the death on July 22 of Mr. Herbert Cook, consulting surgeon to the Cardiff Royal Infirmary, who was lieutenant-colonel R.A.M.C. in command of the Welsh Hospital at Netley in 1916–19.

Herbert George Graham Cook was born in London on September 6, 1864, and was educated at Charterhouse, at University College, London, and at St. Bartholomew's Hospital. He took the English conjoint diplomas in 1889, the F.R.C.S.Eng. and the M.B., B.S. of London University, with honours and gold medal, in 1891, and the M.D.Lond., with gold medal, and the D.P.H.Camb. in 1893. At Bart's he was Jefferson scholar, president of the Abernethian Society, and house-physician; he was also house-physician at the Royal Free Hospital and house-surgeon at the Royal Victoria Hospital, Chelsea. Mr. Cook was president of the Cardiff Medical Society in 1912–13, and for his war services received the C.B.E. He joined the British Medical Association in 1893, was vice-president of the Section of Surgery at the Annual Meeting of 1928 at Cardiff, and served on several committees at headquarters. In 1932–3 he was Chairman of the Cardiff Division.

A colleague writes: Herbert Cook was one of the leading practitioners of Cardiff and the best of colleagues. He was a regular attendant at all medical meetings and frequently contributed to discussions, especially at the clinical meetings of the B.M.A. and of the Cardiff Medical Society. As he read widely and kept abreast of modern methods in diagnosis and treatment his contributions were always valuable, and his interest in his work was such that he would often stop a colleague in the street to chat for a moment or two over some new method of investigation or the prognosis of some case in which he was interested at the time. Although the retiring age of the honorary staff of the Royal Infirmary had recently been raised to 65 he voluntarily retired at 60, and his going some fourteen years ago broke a link with the past so far as the infirmary was concerned, because he was the last of the general practitioners to serve as honorary surgeon. As a man Herbert Cook was precise and accurate in his speech, sympathetic in his outlook, and possessed of a ready sense of humour. He was scrupulous in his actions, his dress, and his attitude to his colleagues, and invariably brought a sane point of view to bear on any question which became controversial. He will be much missed in Cardiff, and especially by those of us who were his colleagues on the infirmary staff and fellow members of the medical societies at whose meetings we delighted to see him.

N. R. DHARMAVIR, F.R.C.S.Ed., D.P.H.

Dr. N. R. Dharmavir, who died on July 8, was born in 1875 in Jullundur District, Punjab. He joined the King Edward Medical College, Lahore, in 1894, and after studying there proceeded to Great Britain in 1899, and took the L.R.C.S., L.R.C.P.Ed. After qualifying he went to practise at Mexborough, Yorks. In 1904 he took the D.P.H. of Cambridge and in 1905 the F.R.C.S.Ed. He then migrated to Padiham, Lancs, where he built up a flourishing practice until his retirement in 1926. His never-failing courtesy and hard work soon endeared him to all. For twenty years he served as medical officer of health to the Urban District of Padiham and was largely connected with several beneficent activities there. He will be remembered as one of the pioneers of maternity and child welfare work, who organized the centre at Padiham in 1914. A friend writes:

Many eminent Indians found their way to Padiham during their visits to England, and the great Punjabi patriot, Lala Lajpat Rai, came to know Dr. Dharmavir intimately while staying as his guest. By nature kindly and benevolent, Dr. Dharmavir soon succumbed to the spell of Lala Lajpat Rai's personality and was persuaded by him to give up his extensive practice in England so that he might direct his unbounded energies to the cause of suffering humanity in India. The crying need of the Punjab then, as now, was the establish-

ment of a treatment centre for tuberculosis, and to fit himself for this task Dr. Dharmavir took a course of radiology in London in 1927. On his return to Lahore he identified himself very closely with the affairs of the Sh. Gulab Devi Memorial Hospital Trust, serving first as secretary, during the lifetime of the founder, and then, on the death of Lala Lajpat Rai, succeeding him as president. On the completion of the hospital he became honorary medical superintendent. He was also honorary physician to the Sir Ganga Ram Free Hospital, another great charitable institution of the Punjab. His zeal to serve was taken advantage of by many in Lahore. He was secretary of the Punjab Branch of the British Medical Association from 1930 to 1937. During his term the meetings were arranged with such care and thought that the profession looked forward to them, and the affairs of the Association were in a flourishing condition, and it was at his suggestion that the Branch inaugurated a scholarship to be given yearly to a student of the Lahore Medical College. Dr. Dharmavir represented the Punjab Branch at the Annual Meeting of the British Medical Association held in Oxford in 1936. He took advantage of his presence in England on that occasion to visit all the most important sanatoria of England and Wales with a view to improving the Sh. Gulab Devi Tuberculosis Hospital at Lahore, which by now had become his chief concern in life, for not only did he give his time to the medical work of the hospital but he also busied himself in collecting funds in various ways. In spite of the serious demands on him he found time to write a book, *Public Health in India*, which was published in 1934 and was very well received. He was also lecturer on forensic medicine at the Law College for two years. At the local self-government institute his lectures on public health were always well attended and greatly appreciated.

In spite of his multifarious activities he found time to run a charitable dispensary for the benefit of the poor villagers of Bengali and surrounding villages near Lahore. His regular visits to this out-of-the-way district were eagerly looked forward to by the poor and the sick, and the finances of the institution he undertook unaided, while in the work he was helped by a small band of voluntary workers, including his wife and daughters. Shy and retiring, Dr. Dharmavir was a man of rare charm and personality. Those who came in contact with him knew the sterling qualities of his heart and understood his sacrifices. He had a high ideal of conduct and was intolerant of hypocrisy. His life was dedicated to the service of his less fortunate fellow-beings, and keen regret was felt throughout India at his untimely and sudden death from heart failure. Messages of sympathy were received by the family from all corners of the Indian Continent, including one from Mahatma Gandhi. He leaves behind a devoted wife and two daughters (both M.B., B.S. of the Punjab University), the elder of whom last year married Mr. S. K. Sen, F.R.C.S., of New Delhi.

W. A. POTTS, M.D.

H. C.-M. sends the following appreciation:

Dr. W. A. Potts was a remarkable man—more so than his actual achievements would suggest. And yet these achievements were of no mean order. Before he left Fettes he had been head of the school and had established a good athletic reputation. At Cambridge and Edinburgh Universities he gained honours and scholarships. As a general practitioner he had a large practice and was beloved by a great number of patients.

At an early stage of his professional career he had developed an interest in mental disorder. This began with his appointment as resident medical officer to the East Riding Mental Hospital and resulted in his becoming one of the medical investigators for the Royal Commission on the care and control of the feeble-minded. In time it led him to take up medical psychology. In this new field Potts came under the influence of Jung, whose theories appealed to him more than did those of Freud. He built up a considerable practice in this specialty. But unlike many of the new school of psychotherapy he remained the all-round physician to the end. He constantly wrote and lectured on the importance of dealing with both mind and body, and in patients referred to him for psychological diagnosis or treatment he frequently detected physical factors that required to be remedied.

For many years he acted as psychological expert to the Birmingham Justices. Thus in mental deficiency, psychotherapy, and delinquency his work was that of a pioneer. It was all characterized by breadth of view, scientific integrity, and a high ideal of social service. And, indeed, in these qualities he was very much his father's son. The first headmaster of Fettes was a man of commanding presence, of great courage, and of notable determination. His eldest son resembled him in appearance, though he lacked his height. But the son had a charm and warmth of manner that his father never possessed, and an intuitive insight which enabled him to understand his patients' problems in a remarkable way. The world is a poorer place since W. A. Potts passed from it.

W. A. JOLLY, LL.D., D.Sc., M.B.

Professor of Physiology at Capetown University

The death of Professor William Jolly, which was briefly announced in our issue of July 22, occurred suddenly at his home at Rondebosch, near Capetown, at the age of 61.

Born in Edinburgh, William Adam Jolly was educated at the George Watson's College and at Edinburgh University, where he studied both medicine and law, winning several prizes in the latter faculty. After qualifying M.B., Ch.B. in 1906 Jolly was for a time assistant to Sir Edward Schäfer, later studying at Leyden as a Carnegie Research Fellow. He returned to Edinburgh to hold the appointment of lecturer in experimental physiology until, in 1911, he accepted the professorship of physiology in the South African College, Capetown. This chair he was to occupy with distinction for nearly thirty years. Appointed Dean of the Medical Faculty, Jolly was largely responsible for the organization, expanded from a college providing only a two-year medical course, of the medical school of Capetown University. In his capacity as dean he showed not only remarkable administrative ability but also a wide human sympathy which endeared him to a whole generation of South African medical students. Despite the extent of his administrative and professorial duties Dr. Jolly devoted much of his time to experimental research. In recognition of his contributions to electrocardiography he received the honorary LL.D of his old university—Edinburgh—of which he was already a D.Sc. A prolific writer, his publications included papers on the "Electrocardiogram," on the "Electrical Response of the Eyeball to Light," and "Observations on the Thyroid Gland and on Reflexes," while he contributed freely to the more important journals of experimental physiology. He was a member of the National Research Council and Board from its inception, and for many years occupied the presidential chair of the Royal Society of South Africa.

Modest and apparently shy in disposition, Professor Jolly possessed rare qualities of camaraderie, and a dry humour which was a delight to his friends. His interests were by no means confined to science, for he was widely read in classical and modern literature. But research and experimental work came first. During the year intervening between his retirement and his untimely death he was at work in the physiological department almost daily, free from the responsibility of teaching and looking forward with obvious happiness to a long career of productive leisure. Professor Jolly became a member of the Capetown Branch of the British Medical Association in 1913. From 1914 to 1919 he served as a member of the council of the Cape of Good Hope Western Province Branch, of which he was vice-president in 1925. He leaves a widow, a daughter, and two sons.

W. E. COOKE, M.D.

Sir Walter Langdon-Brown writes: May I add a few words to your appreciative notice of my friend the late Dr. W. E. Cooke? It was not only his valuable work on haematology and asbestosis that impressed me, but also the extraordinarily stimulating effect which his own enthusiasm had on those with whom he came into contact. He was proud of the fact that he was the first inhabitant of Wigan to become F.R.C.P. since Thomas Linacre, the original president of the College in 1518, who subsequently became rector of Wigan.

Dr. P. JAUVRIN MARETT, who died on July 22, was the elder son of Colonel J. R. Marett, Indian Army. He qualified M.R.C.S., L.R.C.P. in 1904 from the Westminster Hospital and entered the R.A.M.C. In 1912 he was awarded a Beit research fellowship and began to investigate sand-fly fever in Malta, upon which subject he published a paper in the *Journal of the Royal Army Medical Corps* in February, 1913. His research work was interrupted by the outbreak of war, and in 1914 he went to France with the British Expeditionary Force, and was responsible for the sanitary organization of the Rouen Base. He had a distinguished career in France, and during the latter part of the war was consulting bacteriologist to the British Forces in Italy. In 1922 he retired from the R.A.M.C. with the rank of lieutenant-colonel and was appointed medical officer of health for Jersey, which appointment he held until the beginning of this year, when failing health compelled him to resign. During his tenure of office the public health department in Jersey was completely reorganized and brought up to date. The success of his efforts is shown by the remarkable diminution in the incidence of diphtheria and in the death rate from pulmonary tuberculosis during the last fifteen years. Dr. Marett was a keen and energetic worker, and he allowed nothing to stand in the way of what he believed to be his duty. His knowledge and experience were always at the disposal of his colleagues and his advice was always received with respect. He was keenly interested in the work of the British Medical Association and was a regular attendant at the meetings of the local Branch and Division. He read several papers on public health subjects, and in 1935 was president of the Southern Branch.

Dr. EDWARD REGINALD GRIFFITHS, who had practised in Barry, Glamorgan, for thirty-one years, died at his home, Tynewydd House, on July 24. Born in Birmingham on February 20, 1879, son of the Rev. S. A. Griffiths, he studied medicine at the Middlesex Hospital, where he won prizes in chemistry and practical medicine, and qualified M.R.C.S., L.R.C.P. in 1903, taking the M.D. of Durham University in later life. After qualification Dr. Griffiths held the posts of house-physician and casualty medical officer at the Middlesex Hospital, house-surgeon at the Stroud General Hospital, and senior assistant medical officer at the Lewisham Hospital. He served during the war in the Palestine campaign with the rank of temporary captain R.A.M.C. He joined the Cardiff Division of the British Medical Association in 1910, and was medical officer to the Barry Graving Dock from 1910 to 1923. Barry Cemetery was crowded with sympathizers at the funeral on July 24. This is the third obituary notice published within twelve months of medical members of the family of Dr. S. A. E. Griffiths of Southfleet, Kent. Dr. Ethel Rosaline Griffiths died on August 8, 1938, and Dr. Sidney Harold Griffiths on May 6, 1939.

Dr. CUTHBERT ROBERT KENDAL of Hexham, Northumberland, died on July 22 in his ninety-eighth year. He was the oldest surviving student of the medical school at Newcastle-upon-Tyne, from where he took the M.R.C.S. and L.S.A. diplomas in 1863. In his youth (writes Professor Grey Turner) he was a resident pupil at the Gateshead Dispensary, that nursery of so many North Country doctors fifty or more years ago. After qualification Dr. Kendal began practice at the then remote village of Wark, on the North Tyne. When he left, seven years later, to take over the practice of Dr. Jefferson at Hexham he was entertained to a complimentary dinner and given an illuminated address. In Hexham and the surrounding country, which in those days was really remote, he had an extensive practice, which he continued until well over the age of 80. For a time he was joined there by his daughter, Dr. Eva Kendal; his son, Dr. H. R. Kendal, and a grandson are both in practice at Westerhope, near Newcastle-upon-Tyne. Dr. C. R. Kendal was warmly interested in his patients, and always most punctilious and attentive to every detail concerning their welfare. Country life and the farming community and sports were his special relaxation, and he was an excellent card player. He was a Freemason, and for many years chairman of the Albert Edward Club. Almost to the end of his professional life he stuck to the high hat, which enhanced his tall figure so well known in Hexham and around.

FREDERICK CHARLES SCOTSON, of Withington, Manchester, after a long and painful illness, died on July 27 at the age of 70. A native of Warrington, he entered Manchester University and qualified M.R.C.S., L.R.C.P. in 1892. He graduated M.B., Ch.B. with honours, and also took the F.R.C.S., in 1894. After acting as house-surgeon at Manchester Royal Infirmary he went into general practice. For forty years he was one of the best-known practitioners in Manchester and was associated with the Manchester City Football Club. He was a member of the Central Midwives Board and of the Manchester Panel Committee. Dr. Scotson was particularly interested in the work of the Medical Services Subcommittee. He had also been a member of the British Medical Association for forty-three years. During the war he acted as anaesthetist to the Manchester Royal Infirmary and as surgeon to the Newbury Military Hospital. His death will be deeply regretted by his colleagues and by many former patients of his in the Manchester area.

Dr. FREDERICK PARKER GAY, since 1923 professor of bacteriology at the College of Physicians and Surgeons, Columbia University, New York, died on July 14 at New Hartford, Connecticut, his summer home. Born in 1874 and taking his M.D. at Johns Hopkins in 1901, he was a research student under Jules Bordet at the Pasteur Institute, Brussels, from 1903 until 1906. His publications included *Agents of Disease and Host Resistance*, 1935, and *The Open Mind: The Life and Letters of E. E. Southard*, 1938.

Dr. EDWARD CECIL WILLIAMS, consulting physician to the Bristol Royal Hospital for Sick Children and Women, who died on July 23, had been connected with that institution for nearly thirty years. Born in 1867, the son of the late T. Edward Williams, he was educated first at Christ College, Brecon, from which he went to Christ's College, Cambridge, and later to the London Hospital. He graduated M.B., B.Ch. in 1890. His earlier appointments included those of house-physician to the City of London Hospital for Diseases of the Chest, and house-surgeon and receiving-room officer to the London Hospital. He then joined the medical staff of the Bristol Children's Hospital. During the war he held a commission as captain R.A.M.C., and was attached to the 2nd Southern General Hospital. In 1921 he was appointed medical officer to Clifton College, and he was also for some years district medical referee to the Royal Hospital for Diseases of the Chest at Ventnor. He was a Fellow of the Royal Society of Medicine, and took an active part in the work of the section for the study of diseases in children, communicating articles on this subject to medical literature. Dr. Williams was well known in the West of England as a consultant in children's diseases. When he retired from medical practice about ten years ago

he went to live in Much Birch, Hereford. He was twice married, and is survived by his second wife and one daughter.

Dr. SEAN ANDREW TUBRIDY of County Galway, who died on July 15, had been a member of the Dail since 1927, and his death has caused a vacancy in the representation of West Galway. Born in 1897 in Carraroe, Connemara, he received his education first at the local national school, then at Blackrock College, and finally at University College, Dublin, whence he graduated M.B., B.Ch., B.A.O., N.U.I., in 1919. Returning to Galway, he was appointed medical officer of the Lettermore dispensary district after some years of work in Bealadangan. Dr. Tubridy's medical work lay throughout in the west of Ireland, where for many years he was widely respected for his professional skill and his kindness of heart. He distinguished himself in the fight against the typhus epidemic in the Lettermore district in 1924. In 1927 he was elected to the Dail as a Fianna Fail member for County Galway, and at the last two elections was returned for the West Galway constituency. In recent years he had been in charge of the Oranmore dispensary, and his sudden and unexpected death has brought sorrow to friends in Dublin and the west of Ireland. He is survived by his widow, whose father was the late Professor Ryan of University College, Dublin, and three children.

Medical Notes in Parliament

Both Houses of Parliament stand adjourned till October 3 unless recalled earlier for urgent business.

On August 4 the Royal Assent was given to the Public Health (Coal Mine Refuse) Act, the London County Council (General Powers) Act, and other Acts.

A copy was presented to Parliament on August 3 of arrangements for increasing the demand for milk within the area of the Milk Marketing Board for England and Wales by the supply of milk at reduced rates to nursing and expectant mothers and to children under 5 years of age.

A deputation from the Conservative Health and Housing Committee, led by Sir Francis Fremantle, visited Sir John Simon and Dr. Elliot at the House of Commons on August 2, and advocated action for control of proprietary medicines, both on the aspects covered by the Select Committee of 1914 and those recommended by the more recent committee on the taxation of patent medicines. Sir John Simon promised to consider the submissions of the deputation, and it was arranged that a question on the subject should be put in the House.

Hospital Services in War Time

During the debate in the House of Commons on August 1, on the votes for the salary and expenses of the Lord Privy Seal's office, and the emergency hospital and evacuation services, Mr. EDE referred to the fact that in each of the ten sectors into which London and the surrounding districts had been divided voluntary hospital officials had been chosen as the persons to be in charge. Those in charge of the municipal hospitals, he said, had a bigger administrative experience, especially of the kind of problem that an emergency would bring, and it was highly desirable that any organization of the hospitals should be more on the basis of the municipal than the voluntary regime. Mr. BOOTHBY said most doctors knew what they would have to do and where they would have to go. But anxiety had been expressed about the question of nurses, particularly the voluntary nurses.

PROTECTION OF HOSPITALS AND FIRST-AID POSTS

Mr. SIMMONDS said that doctors who would be called on to work in first-aid posts and hospitals in time of war were dismayed at the lack of protection for this work. He hoped that the Minister would be able to indicate that some radical step was being taken in that direction. We were far behind Paris in this matter. There they had thirty underground hospitals with a good degree of protection, and these hospitals gave the doctors a real chance of fulfilling their duty in an air bombardment. There was also the question of the type of building used for our present hospitals. The new Westminster Hospital, a steel-frame structure, was admirable, but four of the main hospitals in the metropolis were of that type of construction which, in Barcelona, had been shown to be hopeless in modern bombing. The floors rested on the outside walls, and if a wall was blown in or out all the floors came down like a pack of cards. It would be better, if there were not sufficient new hospitals, to transfer these hospitals to modern steel-frame commercial buildings, which could be quickly adapted. Mr. Simmonds also asked if the Minister of Health had agreed to provide something better than splinter-proof protection for the operating theatres at the great hospitals in the metropolis.

Dr. HADEN GUEST said he had been amazed to hear one member say that all doctors were completely satisfied, because every doctor knew exactly what he had to do. He wished that were true, but unfortunately it was not. His profession was a very disciplined one, and 96 per cent. of them were on the register of the British Medical Association, and were ready to be sent anywhere or to do anything according to their different capacities; but, unfortunately, the doctors did not get to know exactly what to do. That applied also to the hospitals. A hospital near London, which would have 120 beds under war conditions, had no means of protection for its operating theatre, or for the hospital itself, and it did not know how to get that protection paid for if it ordered the necessary materials. The success of the casualty collecting organization would largely depend on the success of the training and the efficiency of the preliminary exercises that first-aid parties underwent. He asked if "A.R.P. Handbook No. 10" was to be issued.

DR. ELLIOT'S REVIEW

Dr. Elliot said that sites for camps had been purchased, and work had started on twelve camps or was about to begin. They expected the first camps to be ready in three months' time, and thirty-two camps to be completed by the end of this year. It was not possible to billet the enormous number of persons covered by the Government's evacuation scheme in areas which would all have full and complete water supplies and a full system of water-borne sewage. The most careful steps were being taken to see that no undue strain was placed on areas where the water supply was notably deficient. With regard to hospitals, the 100,000 beds on which they were counting for the first wave of casualties were ready. Those were the 100,000 which would be made available by sending home patients who were fit to go. The buildings, beds, staff, and equipment were there. The second wave of casualties would be accommodated in the second instalment of beds for which they were arranging. Those second 100,000 beds were being placed in existing institutions by what they called "crowding." Here again the institutions were there, and the problems of shelter and so on did not arise. It was just a question of beds, bedding, and equipment, and 50,000 beds were already in the hospitals. The second 50,000 would be there by the end of this month.

Sir PERCY HARRIS asked if the hospitals in the London areas were to be used irrespective of location, even though they were right in the danger areas. Dr. ELLIOT replied in the negative. He said that under the sector scheme for London they would cut down to a minimum the use of the institutions in the central areas—those at the hub of the wheel, so to speak. The scheme provided for transferring to the institutions on the rim of the wheel a considerable number of patients who were now in the central hospitals. The hospitals at the hub would not be used to the fullest extent even if extreme urgency arose. Thus, the great teaching hospitals in London would be reduced to the level of big casualty clearing stations.

THE POSITION IN SCOTLAND

The same thing held good for Scotland. A very considerable number of beds would be made available by the removal of patients fit to go. The White Paper relating to emergency hospital accommodation stated that the several institutions which were mentioned would provide accommodation for some 6,000 casualty beds in Scotland. The action taken in Scotland was parallel with that in England.

Mr. KIRKWOOD asked if there was any foundation for the statement that they could not at the moment in Scotland accommodate the ordinary patients anxious to get into hospital. Dr. ELLIOT said that so far as the voluntary hospitals were concerned there was in Scotland a considerable waiting list. The voluntary hospitals formed only a percentage of the hospital beds, and they had to take into account all hospitals, both municipal and voluntary. If, as he hoped, they could keep to schedule, by the end of September in England and Wales they hoped to have huts completed with 1,760 beds, by the end of October with 7,160, by the end of November with 29,500, and by the end of the year with 35,000 beds. At present they had arranged for twenty hutment hospitals in Scotland, covering 7,000 beds. The Office of Works had authorized and was proceeding immediately with the provision of 6,250 beds, and hoped to complete the whole programme of 7,000 by the end of the autumn. In Scotland there would in all be 10,000 new beds in hutments. Roughly they had 9,000 or 10,000 trained nurses enrolled, and some 45,000 auxiliary nurses enrolled for training.

MANAGEMENT IN LONDON

With regard to the position of London, the Minister continued, it was the case, as Mr. Ede had said, that the management of the emergency beds rested rather in the hands of officers of the voluntary than the municipal hospitals. The heads of all the great teaching hospitals, however, had a position of authority and technical pre-eminence in the profession. It was quite wrong to underestimate the prestige factor which they gave. Outside London the administration problem was different, and was simplified by the fact that the deans of the great teaching hospitals were not themselves in administrative units, and, therefore, should find it easy to co-operate with the authorities concerned. The difficulty of putting the London County Council over all the other units should not be underestimated, particularly when it came to the adjoining counties. He very much hoped that the experiment which the Ministry had tried of drawing the executive officers from the voluntary hospitals rather than from any of the single administrative units would be a success. A scheme without the London County Council for London would not be a scheme at all. Therefore, on the body they had set up, after conference with the voluntary hospitals, to work over the plans, they had a representative of the L.C.C. They invited either Sir George Gater himself or any deputy he chose to attend as a member of the committee, and Sir Frederick Menzies, chief medical administrator of the whole of the L.C.C., was a member of that central committee.

Replying to Dr. Haden Guest's example of a hospital which had no protection for its operating theatre, Dr. Elliot said the Ministry had done their best to draw attention to the solution of the problem in their Memorandum No. 1 of the Emergency Medical Services. Paragraph 4 stated that the hospital authorities responsible for institutions in an area likely to be attacked should consider what protective measures were required, and should then, if it was considered that the case was one for Government assistance, submit their proposals to the appropriate Department, together with an estimate of the expenditure involved in the various items. The hospital to which Dr. Haden Guest had referred should make application to his Department forthwith. He would undertake, if it did, that the application would be considered in a very short time, and he would hope that an agreement completely satisfactory to the hospital would be arrived at. Publication of Stretcher Parties' Handbook of Instruction, A.R.P. No. 10, had been held up owing to certain professional differences. These differences had now been composed, and they would get the book out as quickly as possible.

NEED FOR CO-ORDINATION

Sir FRANCIS FREMANTLE emphasized the need for co-ordination. There was a natural tendency, he said, in so huge an undertaking to arrange each unit on its own lines, with the result that the units did not know the powers, possibilities, and resources of the several organizations. One saw that in their own medical service. They saw it in the difficulty of those who were fully occupied in their own areas, such as medical officers of health, not being closely associated with those in another area, and not being fully aware of what was being done by other medical officers or medical men in general practice and in hospitals. There would be a need for improvisation even on the part of those who knew the scheme that had been laid down. What was wanted was a power of improvisation, which was gravely lacking in modern civilization. There was also a need for mobility. Some units would be appallingly overworked, while other units would be idle. There must not be too much rigidity in the organization.

Sir JOHN ANDERSON said that in the nursing services they needed nearly 60,000 volunteers. He was concerned at the shortage still existing in recruitment for first-aid parties and ambulance drivers. His department had been looking into the possible causes of that shortage, and he thought perhaps, in regard to stretcher-bearers, there might be hindrances to recruitment which could be removed, for example, by some modification of the existing arrangements. They had been trying unduly to get two requirements—physique for handling the stretchers, and different requirements for training in first aid which at present they expected the stretcher-bearers to undertake. In London 17,000 ambulance drivers were wanted; there was no reason why some of the older men should not offer their services. In future fitness for the job rather than age would be the determining factor. He had been anxious about the children's respirators and the anti-gas device for babies, which had to be put into mass production on a large scale. These were now in the course of delivery, and while he could not pretend that all the difficulties they had had to encounter had been overcome, and was disappointed that production had not been more rapid, his Department was making every effort to secure delivery of the required quantities at the most rapid rate possible.

The votes were agreed to.

Medical Services in Rhodesia and Nyasaland

In the House of Lords on July 31 Viscount ELIBANK called attention to the recent report of the Rhodesia-Nyasaland Royal Commission. He said that the Commission agreed in principle that amalgamation was in future a natural and desirable thing, but that the main difficulty was the native question. The natives in Southern Rhodesia were better off so far as agricultural and medical services were concerned than those in Northern Rhodesia or Nyasaland. The report stated that in Barotseland, in Northern Rhodesia, provision for education and medical services appeared to have been somewhat seriously neglected.

Viscount BLEDISLOE, who was Chairman of the Royal Commission, said that in his report on the administration in Northern Rhodesia Sir Alan Pim had stated that except along the railway line and in European areas the medical service was defective, and more than half the territory had not the most rudimentary medical facilities. Lord Bledisloe added that he himself had discovered that there were parts of Northern Rhodesia, over an area of something like 15,000 to 20,000 square miles, in which there was no medical service of any sort available for the natives. Something like 50 per cent. of the native population in the territory was affected by some morbid condition, due largely to malnutrition. Very interesting experiments in the Copperbelt showed that the efficiency of the native was affected by malnutrition; an improper balance of food, and in most cases far too much starchy food and very little protein. The experiments had shown that by balancing the ration and giving the natives a due amount of meat during the week they became at least twice as efficient,

had a greater cheerfulness in work, and developed to more than twice the usual extent their immunity to the diseases surrounding them.

Lord MARLEY quoted the Pim Report, which said that the medical provision for the native population was entirely inadequate, and that out of twelve native hospitals "five were very bad," and only two, those at Ndola and Livingstone, were considered by the Pim Committee to be good. It was stated that the public health service was inadequate, there was practically no maternity or child welfare work, and "an improvement in the standard of nutrition was essential to any real advance either in health or education."

The Marquess of DUFFERIN AND AVA said that the Colonial Office shared all the sentiments which had been expressed on the subject of malnutrition. The present position was that the Colonial Office had received dispatches from the Governors expressing their own views and their interpretation of local opinion. Discussions were taking place between the Secretary for the Dominions and Mr. Huggins, Prime Minister of Southern Rhodesia, who was now in England, and he could not give any indication of the decision of H.M. Government with regard to the report of the Bledisloe Commission as a whole.

Certified Cases of Silicosis

On August 1 Mr. GEOFFREY LLOYD, replying to Mr. James Griffiths, circulated the following table of coal-miners in Great Britain certified under the Various Industries (Silicosis) Schemes, 1931 and 1934:

Year	Disablement Cases	Cases of Death not Previously Certified as Disabled
1936	325	22
1937	285	17
1938	437	16

The 1938 figures of new cases, he said, showed increases of 151 and 112 over the 1937 and 1936 figures respectively. The new technical posts recently created at headquarters included an additional inspector to deal with problems of the prevention and suppression of dangerous dusts.

In further reply to Mr. Griffiths, Mr. GEOFFREY LLOYD said that in his report for 1938 the Divisional Inspector for the Swansea Division specially recommended the use of mist sprays "when shot firing and before debris is filled out." He had at present no power to enforce the use of mist sprays, but no opportunity was lost by the inspectors of urging their use in suitable circumstances. The number in use in the Swansea Division was steadily increasing.

Cost of War Casualties to Voluntary Hospitals

On August 1 Sir IRVING ALBERY asked what complaints the Minister of Health had received from voluntary hospitals concerning the proposed Government contribution in case of war casualties; and what action he proposed to take.

Miss HORSBRUGH (Parliamentary Secretary to the Ministry of Health) said that the matter was under negotiation, but the Government had accepted full responsibility for the cost of treatment of war casualties in voluntary hospitals. The Government proposed to make payments on account, subject to adjustment at a later data. The precise basis of the payments and points arising out of the proposals were under discussion with the British Hospitals Association.

Doctors' Petrol Supply in War Time

In the House of Commons on August 1 Mr. GEOFFREY LLOYD made a statement regarding the arrangements for the maintenance of petrol and oil supplies in war time. He said that special arrangements were being made for meeting the requirements of fire brigades, ambulances, and A.R.P. services. After due notice had been given, a rationing scheme would be introduced for all private cars. Under this scheme such cars would be given a ration related to the horse-power of the car, and provision would be made for owners who considered the ration insufficient for essential needs to state their case to the divisional petroleum officer, who would be empowered to grant an additional allowance where he was satisfied this was justifiable.

It is understood that the requirements of doctors will be met on application to the divisional officers.

Health of School Children

During a debate on August 2 on education, Mr. LEES-SMITH said the figures published by the Board of Education with regard to the physical condition of children were misleading, and were contradicted by the medical profession, especially by the medical experts who were developing the science of nutrition. Lord Dawson of Penn in the House of Lords had repeated the figures of the British Medical Association, showing that about a quarter of the children had not the diet necessary for their development. How could the Board of Education issue figures showing that only 1 in 150 suffered from bad nutrition and only 10 per cent. of the children were slightly subnormal? The new militiamen were of a different standard from the boys of twenty-five years ago, but 90 per cent. of those whom he had lately seen would be subnormal by the standard of the boys from Eton, Harrow, or Charterhouse. The first reform must be to take the advice of the medical profession.

Sir ERNEST GRAHAM-LITTLE spoke of the part which ought to be played in the educational system by the cinematograph, and asked the Government to give a grant for the supply of films as well as of projectors.

Replying to the debate, Mr. KENNETH LINDSAY said the whole school curriculum had been too attached to the universities and matriculation. It was now hoped to work out for the years between 16 and 17½ a series of courses for boys and girls with real connexion with their future callings—in the case of girls, with nursing. He agreed with Sir Ernest Graham-Little on the educational value of films. There was a grant of 50 per cent. for projectors and of 20 per cent. for films, and the Ministry was unlikely to pay more. He cited a report signed by the Advisory Council on Nutrition which said that the clinical method of assessing nutrition given in Administrative Memorandum 124 of the Board of Education was the most promising. The Board of Education did not rely on this clinical assessment. It advocated six-monthly surveys so that all children might be examined for signs of malnutrition.

Report on Nutrition in the Colonies

In an answer on August 2 to Mr. Kennedy and other members Mr. MALCOLM MACDONALD said the report of the Committee on Nutrition in the Colonial Empire (see *Journal*, August 5, p. 294) had been brought to the attention of the Governments of all the Colonial Dependencies, and would receive full consideration with a view to appropriate action. In all parts of the Colonial Empire increased attention was paid to maternity and child welfare work, and in several cases had led to a reduction in infantile mortality, although in many places the figures were still much too high. Several Legislatures had voted sums for the feeding of school children. Nutritional surveys were in progress in Nyasaland and Tanganyika.

Admission of Refugee Doctors

Mr. ERSKINE HILL asked on August 2 whether the quota for alien doctors permitted to practise in this country had been reached; and whether Sir Samuel Hoare could make any statement as to the attitude of his Department to the serious effect of over-competition in certain branches of the profession. Mr. PEAKE replied that the policy of the Home Office, settled after consultation with representatives of the medical profession, had been that permission should be given to a restricted number of foreign doctors who had come here as refugees to practise or to take appointments in this country. It had been recognized that the number of foreign practitioners who could properly be absorbed in the medical profession was

limited. Sir Samuel Hoare knew no ground for any suggestion that the admission of refugee doctors had led to overcompetition in certain branches of the profession.

Blood Storage for Transfusion

Dr. HADEN GUEST asked Dr. Elliot on August 3 whether the blood taken from donors to be stored for use in emergency was stored separately or mixed in bulk; whether he was satisfied as to the condition of such storage; and whether the danger of the conveyance of disease was adequately safeguarded. Dr. ELLIOT said in reply that donors of blood were being grouped and registered, but would not be asked to give blood unless and until an emergency arose. The blood taken from each donor would then be stored separately and not mixed. The arrangements for storage were under the supervision of pathological experts. There was no danger of disease being transmitted through blood that had been stored under proper conditions.

Replying to supplementary questions put by Dr. Haden Guest and Sir Francis Fremantle Dr. ELLIOT said blood was not being stored in bulk at the present time. Separate arrangements for the different qualities of blood were being borne in mind.

Civil Nursing Reserve Progress

Dr. ELLIOT stated on August 3 that there were then some 7,500 trained nurses and 2,900 assistant nurses enrolled in the Civil Nursing Reserve, and approximately 45,000 women had applied for training as nursing auxiliaries. In addition it was hoped that the majority of the immobile nursing members of voluntary aid detachments, some 24,000 in number, who had been released from their service obligations would enrol in the Civil Nursing Reserve, 6,500 having already applied for enrolment. The arrangements for training auxiliaries were in the hands of the county and county borough medical officers of health with their local emergency committees, the scheme of training having been laid down by the Central Emergency Committee for the Nursing Profession with his approval. The training consisted in lectures in first aid and home nursing and a period of instruction in hospital, amounting, if possible, to a fortnight or ninety-six hours taken over a longer period, although a minimum of a week or fifty hours was permitted. Refresher courses for trained nurses were being arranged by the Royal College of Nursing, and in some areas by the medical officers of health and their local emergency committees.

Midwifery Services in Reception Areas

Sir FRANCIS FREMANTLE asked on August 3 whether, in view of the difficulties of providing for the care of expectant mothers in reception areas in the event of the Government's evacuation plans being put into operation, an adequate number of experienced midwives would be available. Dr. ELLIOT answered that no midwife engaged in the hospital or domiciliary practice of midwifery, whether a trained nurse or not, would be diverted to casualty or other non-midwifery work until the full requirements of the midwifery service in time of war had been met. Local authorities in areas to be evacuated should make arrangements to send with expectant mothers, for work in the reception areas, a full quota of practising midwives with recent midwifery experience, and should arrange that where necessary such midwives should be obtained from all institutions and organizations in the area which, owing to the discontinuance or curtailment of their maternity work, would have midwives to spare. Similar considerations applied to midwives normally employed in the reception areas, where midwives should not be diverted to other services until the requirements of the midwifery service had been supplied.

Institutions Outside Emergency Hospitals Scheme

Mr. DUNN asked Sir John Anderson on August 3 whether he had considered representations made to him by the joint hospital boards of the country in general, and the Wandle Valley Joint Hospital Board in particular, arising out of air raid precautionary measures for and on behalf of such hospitals. Sir JOHN ANDERSON answered that he had considered a number of representations on this subject, including those mentioned. He had decided that local authorities in the areas most exposed to attack should be asked to provide protection, of the approved blast- and splinter-proof standard, for the inmates and staff of certain types of residential institutions, such as public assistance institutions, mental hospitals, infectious diseases hospitals, and other hospitals not included in the Emergency Hospitals Scheme. It was not possible within the compass of this answer to set out in full all the types of institutions to which this decision would apply, but he proposed to issue to the local authorities concerned as soon as possible a circular letter giving guidance on this subject. The approved expenditure incurred would be borne by the Exchequer and the local authorities in the proportions laid down by the Air Raid Precautions Act.

Milk Pasteurization.—On August 2 Miss HORSBRUGH told Sir Ernest Graham-Little that Dr. Elliot was unaware that any local authorities had power to enforce the pasteurization of milk sold in their areas. He did not know of any case of prosecution for the sale of tuberculous milk. The ordinary practice where tuberculous milk was discovered was, if possible, to trace the source of infection and to cause the infected cows to be slaughtered.

Inadequate Pasteurization.—Sir PERCY HURD asked Dr. Elliot on August 4 whether his attention had been called to the disclosure in the report of the county medical officer for Wiltshire that pasteurized milk used under the milk-in-schools scheme and also pasteurized milk sent wholesale to London and elsewhere had been found to be tuberculous. Dr. ELLIOT said in reply that his attention had been called to this report by the county council. Investigations were made, and certain pasteurizing plants in the county were found to be producing milk which was inadequately pasteurized. The county council informed the local authorities concerned, and the latter took the matter up. In forwarding the report to him the county council recommended that the responsibility for the licensing and supervision of pasteurizing plants should be transferred from the local authorities with whom it now rested to the county council. This recommendation would involve an amendment of the Milk (Special Designations) Orders which would arouse controversy, but he would bear it in mind for consideration when other amendments of the Orders were contemplated.

Protection of Newcastle Operating Theatre.—Mr. DAVID ADAMS asked Dr. Elliot on August 3 whether his attention had been called to the protests made at Newcastle City Council meeting against his refusal to sanction the erection of a building as an operating theatre more heavily protected than for blast and splinter, which, in time of war, would require to be used by two-thirds of the operating surgeons, assistants, and anaesthetists. Dr. ELLIOT said he had seen reports of a discussion on this matter at a meeting of the city council. He was anxious to find a practicable solution of this difficult problem, the technical aspects of which had been fully discussed by his officers with members and officers of the council. He would communicate further with the council.

Mental Hospitals for Military Casualties.—On August 3 Mr. SORENSEN asked Dr. Elliot to reconsider the intention of utilizing certain mental hospitals for the purpose of dealing with military casualties. Dr. ELLIOT replied that the present intention was to utilize for military casualties parts of two mental hospitals only. In the war hospitals scheme full account had been taken of the probable needs of the civil population requiring treatment for nervous or mental breakdown.

Medicine Stamp Duties.—Captain G. S. ELLISTON asked Sir John Simon an August 4 what were his intentions with reference to the Medicine Stamp Duties. Sir JOHN SIMON replied that he had been in consultation with Dr. Elliot. They proposed jointly to appoint a committee to examine the whole question. This committee's inquiry would cover both the control and taxation aspects, but the exact terms of reference were not yet decided.

Notes in Brief

The field work of nutritional survey as described in the report of the Ministry of Health for 1937–8 and the collection of statistical data with reference to the distribution of the population according to income have been completed. After necessary analysis they will be considered by the Advisory Committee on Nutrition.

Dr. Elliot cannot at present set up a Governmental inquiry into the merits of a State medical service.

The power of the Minister of Health to require the formulation of a scheme for the provision of full-time medical officers of health under the Acts of 1929 and 1933 has been exercised in ten counties.

Sir Samuel Hoare is in communication with the Secretary of the Joint Industrial Council on the question of extending the present silicosis scheme to cover all underground employment in slate mines. Investigations by the Home Office do not show that surface workers are affected by silicosis in the same way as underground workers.

The estimate for the Highlands and Islands Medical Service is increased in the present year by £10,000.

Medico-Legal

UNSUCCESSFUL ACTION AGAINST DOCTOR AND HOSPITAL

In May, 1937, a Mrs. P. D. Mitchell entered the Crayford (Kent) Russell Stoneham Memorial Hospital for her confinement. She developed puerperal fever and septicaemia, and some weeks later her right leg was amputated. She claimed damages from Dr. T. C. Outred of Northfleet, who treated her in hospital, and against the matron and board of management of the hospital, alleging that her illness and the loss of her leg were due to their negligence. Counsel for Mrs. Mitchell said in opening the case that Dr. Outred had agreed to attend her in her confinement. The temperature book showed that on the evening of May 3, two days after her confinement, her temperature was 100.2, on the morning of May 4 it was 101.4, and on the evening of that day it was 100.2. (Puerperal fever is notifiable if the temperature is 100.4 for twenty-four hours.) Sterilized masks, gloves, and clothing had not been used at her confinement. Prontosil had obscured the signs of puerperal fever. The night nurse had told Mrs. Mitchell that she was not to ring her bell except in an emergency. On May 21 she was sent home in an ambulance, and next day her temperature was 103° F., but Dr. Outred had attributed that to the excitement of the journey. Some days later she had complained of pain in her right thigh and the doctor had diagnosed pyaemia, but he had not sought a second opinion or tested her blood. Her temperature rose and she became delirious, and her leg was amputated. After hearing all the evidence brought by Mrs. Mitchell, the Lord Chief Justice held that there was no case to go to the jury, as there was no evidence to connect the amputation of her leg with any negligence or breach of duty by any of the defendants. He gave judgment for the defendants, with costs, and refused a stay of execution of the judgment, saying that the action was quite misconceived.

A SLANDER ACTION: ORDER FOR NEW TRIAL

In our issue for March 11, at page 539, we gave some account of an action brought by two certified midwives against the British Medical Association and Dr. Irene Gayus, in which a settlement was reached with the Association and a special jury awarded £800 damages against Dr. Gayus for slander. They complained that Dr. Gayus had told Dr. R. W. Durand, then assistant medical secretary of the Association, that she wanted to send a patient to the nursing home managed by the plaintiffs but had heard that abortions had taken place there. Dr. Gayus appealed, and on July 13 the Master of the Rolls, giving the judgment of the Court of Appeal, said that the summing-up of Mr. Justice Greaves-Lord contained two defects which were sufficient to justify the court in directing a new trial.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The E. G. Fearnsides scholarship has been awarded to K. C. Dixon, Ph.D., M.A.; and A. F. Huxley, B.A., has been elected to the Michael Foster studentship in physiology.

The following candidates have been approved at the examination indicated:

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.—*Part I:* R. D. Howat, S. R. Reynolds. *Part II:* H. N. Bhatt, J. P. Bostock, F. Bush, F. M. Crawshaw, W. G. S. Harden, T. M. Hennebry, S. W. Horncastle, K. A.-K. Kassem, C. F. MacGuire, S. A. Maddocks, R. T. Marshall, G. F. Rees-Jones, Zoë C. Rutherford, E. Samuel, Ida B. S. Scudder, W. E. McL. Topping.

At a congregation held on August 5 the following medical degrees were conferred:

M.D.—D. N. Matthews, J. D. M. Jones.

M.B., B.CHIR.—By proxy: A. J. S. B. Tawse, R. O. G. Norman, N. E. Monteuuis, J. A. Glover, J. N. Pattinson, J. F. Buchan, I. R. S. Gordon. In person: K. C. Dixon, J. R. Bolton, M. A. X. Cochemé, J. M. Naish, J. H. Penrose, G. S. Graveson, W. J. D. Fleming, F. McL. McGown, K. S. MacLean, A. D. Fisk, G. M. Lewis, T. K. Maurice, G. C. Wells, J. H. Dean, T. Fenwick, R. H. Armin, D. M. Baker, A. P. Dick, J. M. Holford, I. MacG. Jackson, W. H. K. Willis, E. P. Morley, J. H. Burkinshaw, H. R. E. Wallis, O. J. Curl, R. Fletcher, A. Standeven, P. D. Scott, D. L. Caldwell, R. H. Elphinstone, O. D. Gilmore, H. W. Whittingham, J. F. Erskine, P. W. Isaac, T. C. N. Gibbens, G. W. Harris, J. A. Lorimer, P. D. MacLellan, J. Murray, P. D. Samman, P. S. Thorne, L. D. Osler, W. H. C. Watson.

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

M.D.—*Branch I (Medicine):* I. S. Buchanan, M. A. Carpenter, J. E. Cates, C. S. Darke (University Medal), R. B. Evans, A. C. Kanaar, D. Landsborough, D. H. G. MacQuaide, J. B. Phillips, J. W. Pierce, H. Ramsay, J. C. Roberts, G. R. Royston, F. H. Scadding, J. W. Todd (awarded mark of distinction). *Branch IV (Midwifery and Diseases of Women):* Mary A. M. Bigby, C. W. F. Burnett. *Branch V (Hygiene):* J. D. Kershaw, V. N. Leyshon, J. P. McGladdery, R. C. Wofinden.

PH.D. IN THE FACULTY OF MEDICINE (NON-CLINICAL).—G. Brownlee, H. Davis, M. F. El-Seifi, O. Khairat, Li P'ei Lin, Margaret Ll. Smith, V. D. van Someren.

UNIVERSITY OF MANCHESTER

Mr. R. L. Holt, M.D., F.R.C.S., has been appointed Lecturer in Operative Surgery.

CONJOINT BOARD IN SCOTLAND

The following candidates have been approved at the Final Examinations for the Scottish Triple Qualification:

G. Abromowitz, W. S. Aird, T. Akroyd, G. Alterbaum, F. E. O. Ampofo, D. A. Bird, M. Bregman, G. E. Calvert, R. M. F. Charles, W. J. Curran, W. N. Darling, E. Dengrove, G. Dison, C. Drayer, Edith M. Druitt, R. S. Edington, A. F. Fletcher, W. M. Glantz, H. T. Hardy, Mary K. Hargreaves, Barbara J. Hawke, D. Hochman, J. A. Hunter, P. Jardine, E. R. K. Keatley, T. Khattar, R. L. Lawrie, A. S. A. Malek, W. A. W. Maney, F. B. Marke, J. G. B. Maree, S. R. A. Messih, I. Miskelly, H. Mullen, A. J. MacIver, W. T. T. McAllister, C. W. Orr, H. R. Pace, E. G. Patchett, N. Pearl, T. J. Reid, Mary Robertson, A. W. W. Robinson, A. I. Rosenblatt, C. Rudd, L. Ryterband, G. J. Sabrin, C. D. Salmond, M. Schneider, N. M. Segal, R. M. E. Smith, E. J. Stern, L. L. Theron, G. A. Thompson, C. M. Vanniasegaram, D. K. Windram.

The following graduates of recognized foreign universities were also admitted Licentiates:

A. Adler, A. B. Alexander, Declan R. Barry, A. Beck, M. Caraco, W. Cohn, W. Griffel, E. Guttmann, E. Haberfeld, F. A. Heimann, R. F. H. Hinrichsen, M. Laufer, E.-H. Levi, C. Perec, F. E. Rosenthal, R. Spira.

Medical News

The third number has been published of the quarterly reports on chronic rheumatic diseases under the new title of *Annals of the Rheumatic Diseases*, which is the official journal of the Empire Rheumatism Council. Among other articles it contains one by Dr. Ludvig Aschoff entitled "The Rheumatic Nodules in the Heart." Single numbers are 6s. each, and the annual subscription is one guinea, post free. It is published by Messrs. H. K. Lewis and Co., Ltd., London, W.C.1.

The London and Counties Medical Protection Society has now arranged that, on payment of an additional subscription of £2 per annum, members of the society can be indemnified in respect of cases in which they are involved and which are either heard in courts over-seas or need to be dealt with over-seas. Such indemnity will be to the extent of £1,000 in any one case or to a maximum of £2,000 in any year of membership. The scheme has been arranged through Lloyds' underwriters, and full details can be obtained from Dr. R. W. Durand, the secretary of the society, Victory House, Leicester Square, W.C.2.

Nearly 600 delegates attended the fifth International Congress for Life Saving and First Aid to the Injured held at Zurich and St. Moritz from July 22 to 29. The British delegation included Dr. Thomas E. A. Stowell (chairman), Dr. Esther H. Killick, Dr. T. Gwynne Maitland, Dr. A. J. Amor, Dr. R. Salisbury Woods, Dr. A. C. White Knox, Dr. J. B. Sherman, Dr. W. Blood, Dr. F. S. Carson, Dr. J. B. Wrathall Rowe, and Mr. Gerald L. Perry (secretary). Dr. Stowell was elected a vice-president of the permanent committee of the Congress and was one of the speakers at the opening ceremony at the Congress Hall, Zurich, and at the official banquet at the Klum Hotel, St. Moritz.

A system of appointments for out-patients has been started at University College Hospital, London, which is proving an unqualified success. Patients are now seen by appointment at all the twenty-one medical, surgical, and special clinics in the out-patient department. Additional staff have been appointed to work the appointments bureau in the out-patient records room. New patients or their doctors can make appointments over the telephone or through the post, and old patients book an appointment for their next attendance after each visit.

At the annual meeting of the British Dental Association held in Newcastle-upon-Tyne recently Mr. T. R. D. Walkinshaw, in his presidential address, declared that efficient ante-natal and post-natal dental service, dental care of the pre-school child, a complete dental school service, and statutory dental benefit for the adolescent and adult insured population were matters calling for the immediate attention of the Government, and the exercise of the wide powers possessed by the Ministry of Health and the Board of Education. The present school service, Mr. Walkinshaw said, was wholly inadequate to deal with the demand for dental treatment among school children. He suggested that a Royal Commission should be set up to examine every aspect of the present public dental service.

The international Maurice Cazin prize of the value of 4,000 francs is offered by the Société de Chirurgiens de Paris. Further information may be obtained from the secretariat of the Society, 60, Boulevard de la Tour-Maubourg, Paris 7e.

Professor J. Rodhain, director of the Leopold School of Tropical Medicine at Antwerp, has been elected a member of the Belgian Royal Academy of Medicine.

A new chair for medical hydrology is to be founded in the Medical Faculty of Rome.

The Hôtel-Dieu of Quebec will shortly celebrate the ter-centenary of its foundation, which dates from the time of Louis XIII and was due to the Duchess of Aigullon, niece of Cardinal Richelieu.

EPIDEMIOLOGICAL NOTES

Diphtheria and Scarlet Fever for the Week

Notifications of diphtheria have risen slightly in England and Wales and Scotland and fallen in Eire and Northern Ireland. The figures for England and Wales and London remain well below those for the corresponding week last year and also below the median value for the last nine years. The disease remains prevalent in both urban and rural districts, but there are no reports of outbreaks of unusual magnitude from any centre. The recent increase in the incidence of scarlet fever in England and Wales has not been maintained, notifications having dropped from 1,925 to 1,815, and in London from 191 to 165. The numbers, however, remain well above the figures for the corresponding week last year and the median value for the last nine years. In Scotland and Northern Ireland small decreases have been recorded and in Eire a slight increase.

Dysentery and Poliomyelitis

Dysentery appears to be on the increase in England and Wales, where 65 cases were notified during the week compared with 30 in the previous week, while in London notifications rose by 1. The counties chiefly affected were: London 11 (Bethnal Green 2, St. Marylebone 2, Stepney 2, Deptford, Hackney, Hammersmith, Poplar, and Southwark 1 each), Berkshire 21 (Abingdon 20, Maidenhead 1), Essex 16 (Colchester), Lancashire 4 (Bolton 2, Liverpool 1, Preston 1), Derby 3 (Shardlow 2, Blackwell 1), Northumberland 3 (Newcastle-upon-Tyne), Yorks West Riding 3 (Bradford 1, Sheffield 2), Warwick 2 (Birmingham), Gloucester 1 (Bristol), and Glamorgan 1 (Cardiff). The Abingdon cases belong to an outbreak from a camp at Radley in which twenty children, all under 5 years of age, were affected. They were all removed to the Abingdon Isolation Hospital. Poliomyelitis continues to increase, although the number for the week is only a little more than half that for the corresponding week last year, when an epidemic of considerable magnitude followed. Cases have been reported from eight counties, London with 9 (Bermondsey 1, Camberwell 3, Islington 1, Paddington 1, Southwark 3), Lancashire 7 (Liverpool 1, Manchester 4, Droylsden 1, Warrington 1), Nottingham Borough 2, Kent 1 (Ramsgate), Salop 1 (Oswestry), Somerset 1 (Burnham-on-Sea), Southampton 1, Surrey 1 (Merton and Morden Urban District). In Camberwell there have been 3 cases following 4 cases last week and 1 in the previous week. At Eton College there have been 2 cases in boys aged 14 and 15 respectively; in the latter case the disease is regarded as polio-encephalitis. About 30 of the contacts in the same house have been placed in quarantine for ten days, but older boys and those who were thought to be not exposed, numbering 20, have been allowed to go home. It was suggested that the boys contracted the infection from bathing in the river, but there is no proof of this so far. Last year all river bathing was stopped on account of the prevalence of poliomyelitis.

Typhus Fever in North Africa

In Egypt typhus fever had reached its height in the four-week period ended May 20, when 845 cases were notified for the whole country. The numbers fell in the next two four-week periods to 677 and 323 respectively. During this last period cases declined in the three provinces of Lower Egypt which were most affected—namely, Gharbiya from 155 to 105, Daqahliya from 177 to 84, and Minufiya from 90 to 62. Tunisia suffered from the most important epidemic recorded in recent years. From January 1 till July 16, 5,403 cases were recorded, compared with 2,377 for the whole of 1938 and 3,778 for the whole of 1937. The decline of the epidemic was relatively slow; in the four-week period ended May 21, 1,075 cases were reported, and in the next two four-week periods 974 and 937 cases respectively. During this last period the disease declined in the northern districts, but the number of cases continues to increase in the centre of the country, rising from 257 to 303 in Sfax district, from 89 to 116 in the district of Gafsa, and from 68 to 73 in the Thala district. In Algeria 214 cases were notified during the four-week period ended July 15, but only 41 cases were recorded in Morocco, where the seasonal maximum had already been reached by February.

No. 30.

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended July 29, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930-8 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	25	2	3		—	26	1	10	2	1		
Deaths		—	1				1	3				
Diphtheria	883	89	134	23	12	1,007	154	106	46	14	918	154
Deaths	20	—	2	2	—	19	3	4	2	—		
Dysentery	65	11	20		—	36	5	31		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	4	1	—		—	2	—	—		—		
Deaths		—					—					
Enteric (typhoid and paratyphoid) fever	19	2	6	8	4	32	4	4	3	—	52	
Deaths	1	—	—	1	—	—	—	1	—	—		
Erysipelas		23	59	4	3			42	2	4		
Deaths		—					—					
Infective enteritis or diarrhoea under 2 years												
Deaths	34	9	14	3	1	42	22	9	4	3		
Measles		28	53		1			62		14		
Deaths	1	—	—	1	—	5	1	1	2	1		
Ophthalmia neonatorum	106	5	33		1	98	5	51		—		
Deaths												
Pneumonia, influenzal*	415	26	4	3	2	589	43	15		2	464	38
Deaths (from influenza)	12	6	—	1	—	16	1	1	3	—		
Pneumonia, primary			99	9				110	6			
Deaths		6		4	8		17		8	7		
Polio-encephalitis, acute	2	—				—	—					
Deaths		—					—					
Poliomyelitis, acute	23	9	—		—	41	3	4		—		
Deaths		—					—					
Puerperal fever	4	4	12	2	2	5	5	18	1	1		
Deaths		1†					1†					
Puerperal pyrexia	191	13	28		—	182	17	25		—		
Deaths												
Relapsing fever	—	—			—	—	—			—		
Deaths												
Scarlet fever	1,815	165	173	55	49	1,553	128	271	64	49	1,627	214
Deaths	1	1	1	1	—	5	1	1	—	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—				—	—		
Whooping-cough		210	25		12			25		15		
Deaths	9	—	—	—	—	7	—	1	1	—		
Deaths (0-1 year)	256	40	65	17	18	272	49	52	34	11		
Infant mortality rate (per 1,000 live births)	41	36				45	40					
Deaths (excluding stillbirths)	3,752	701	527	162	125	3,814	718	511	160	109		
Annual death rate (per 1,000 persons living)	9.2	9.0	10.7	10.9	11.0	9.4	9.1	10.4	10.8	9.7		
Live births	6,304	1,076	953	344	264	6,819	1,248	888	373	294		
Annual rate per 1,000 persons living	15.5	13.8	19.3	23.1	23.2	16.8	15.9	18.1	25.3	26.1		
Stillbirths	257	42	39			249	33					
Rate per 1,000 total births (including stillborn)	40	32	39			35	26					

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.
† Death from puerperal sepsis.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS.—All communications should be addressed to the Advertisement Manager (office hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are

EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*

SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone 24361 Edinburgh), and of the Office of the Cumann Doctúirí na h-Eireann (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin.)

QUERIES AND ANSWERS

Cause of Fibrillation of Calf Muscles

Dr. F. LACHS (Manchester) writes: In recent years many cases have been reported where fibrillations of the various muscles of the body were present. These fibrillations, unless they were caused by definite organic disease, have been regarded as the expression of a toxic invasion of the central nervous system by toxins of bacterial origin. In most cases a focus could be found in the teeth, the tonsils, or the accessory air sinuses. The toxins run along the nerve sheaths until they mix with the cerebrospinal fluid. They are more or less neurotrophic, and if they are particularly so they become fixed to the anterior horn cells of the higher spinal segments. Generally, however, the toxins travel down the spinal canal and become anchored to the motor cells of the lower spinal segments. Here they lead to irritation of the motor cells with subsequent twitchings and fibrillation of the muscle fibres. Therefore fibrillations are chiefly, and at first, seen in the muscles of the leg. In course of time other muscles are involved and damage to joints and to the heart—to the latter probably via the vagus nerve—occurs. Thus the fibrillation of the muscles of the leg is regarded as an early symptom of focal sepsis. Very rarely electrical changes can be found. There is no wasting and no gross inability to use the muscles, and there is very seldom real pain. In many cases the process was reversible, and a cure could be effected by the eradication of the focus. It may be that the case to which Dr. "X." (July 22, p. 208) refers belongs to this group and must be regarded as an early manifestation of focal sepsis.

Frigidity after Childbirth

Dr. ALISTAIR FRENCH (Greenford) writes in reply to "Doctor" (July 29, p. 263): I suggest that, in the absence of menstrual irregularity pointing to endocrine disturbance and of pelvic abnormality such as retroversion, the cause of the frigidity is psychogenic—namely, fear of another pregnancy. The treatment is reassurance, the fitting of a Dumas cap to be used with chemical contraceptives (100 per cent. contraceptive safety), and a little alcohol orally before coitus.

Treatment of Writer's Cramp

"L.R.C.P. and S." writes: I have a case of writer's cramp on whom diathermy with massage and psychological treatment have been tried, with a little relief from the former but no result from the latter treatment. The patient improves on rest. Could we hope for any improvement by use of gland therapy? The experience of any reader along this line would be much appreciated.

Income Tax

Pension from Abroad

"VICTORIA" receives a pension from abroad. He has been living in England for the past ten years. If he leaves this country before October 1 will he be liable to tax thereon for the current financial year?

*** Yes. A visit here of less than six months in any one financial year by a foreign resident does not create liability, but an absence for a similar period—or even a longer one—of a resident in the United Kingdom does not give a title to relief. On the other hand, if, say, £*x* of the pension is not received in the United Kingdom during 1939–40 (for example, because it was received and expended abroad), the liability for 1940–1 will, on the basis of the previous year, be reduced by £*x*.

Foreign Dividends

"S. V." asks whether payment of tax can be required in respect of dividends which have been declared by a foreign company but which cannot be remitted to the shareholder owing to the action of the foreign Government.

*** Income tax attaches to such income when it arises, and it is considered that the courts would support the view that it arises when the dividend is declared. Consequently the Revenue view that our correspondent is assessable is correct; but we understand that payment of the tax will not be required before the income is remitted if it would involve hardship on the taxpayer. We suggest that our correspondent write to the inspector of taxes accordingly.

LETTERS, NOTES, ETC.

Mr. C. G. Andrews

The end of July saw the retirement on pension of Mr. C. G. Andrews, chief clerk of the Examining Board in England of the Royal College of Physicians of London and the Royal College of Surgeons of England. Mr. Andrews has completed forty-seven years of service at the Examination Hall, first on the Embankment and, since 1912, in Queen Square, Bloomsbury, and is probably known personally to more medical men and women than any other member of the staff of the Board. For thirty-five years he has personally informed every candidate of the result of his or her examination in surgery, both for the Fellowship of the Royal College of Surgeons and for the M.R.C.S., as well as for the L.D.S. It is estimated that his smiling "I am glad to tell you that you have passed" has been welcomed by some twenty-three thousand Fellows, Members, and Licentiates, while his sympathetic "I am sorry to say that you have failed" has softened the blow for many more thousands. Mr. Andrews's countless friends in the profession will wish him many years in which to enjoy his well-earned rest.

The Medical Directory: Uncommunicated Addresses

The Editor of the *Medical Directory*, 104, Gloucester Place, Portman Square, London, W.1, desires to notify members of the medical profession that certain of their number have not communicated to him their present addresses. He asks that the persons in question will kindly give the information without delay. Otherwise the words "(*address uncommunicated*)" will appear in lieu of an address in the forthcoming 1940 issue.

Disclaimers

Dr. F. BARNETT MALLINSON writes: There appears in a London newspaper (and possibly other similar publications), dated August 3, a paragraph headed "Policeman Finds Stolen Anaesthetic Machine." I should like to point out with emphasis that this was published entirely without my knowledge or consent; in fact, my secretary, when rung up about it, refused to make any comment whatever to the reporter, and no further attempt to get into touch with me was made. Full details were, of course, given to the police *only* at the time of the theft.

Dr. M. COPLANS (Hendon) writes: The statement which appeared in the earlier editions of a London evening paper on August 1 in which my name is mentioned was unauthorized by me and was published without my consent. I have had no communication with the reporter, as is stated.